~~Agricultural Dept~~
LIBRARY
OF THE
UNIVERSITY OF CALIFORNIA.
Mass Lib.
Agric. Dept
GIFT OF
U. S. Dept of State
Received Oct, 1889.
Accessions No. 39424 Shelf No.

AGRICULTURAL
LIBRARY,
UNIVERSITY
OF
CALIFORNIA.

AGRICULTURAL
LIBRARY,
UNIVERSITY
OF
CALIFORNIA.

HOUSE EXECUTIVE DOCUMENT, No. 51.

FORTY-NINTH CONGRESS, FIRST SESSION.

CATTLE AND DAIRY FARMING.

IN TWO PARTS.

UNITED STATES CONSULAR REPORTS.

CATTLE

AND

DAIRY FARMING.

PART I.

LIBRARY
OF THE
UNIVERSITY
OF
CALIFORNIA.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1888.

SF197
U6
v.1

Mass Lib.
Agric. Dept.

39424

CONTENTS.

Page.

SECRETARY'S LETTER 3–40

AFRICA.

Cape Colony (Consul Siler, Cape Town) 669, 670
Mauritius (Consul Prentis, Port Louis) 673
Morocco (Consul Mathews, Tangiers) 672
Seychelles (Consul Mussey, Mahé) 673, 674
Sierra Leone (Consul Lewis, Sierra Leone) 671
Zanzibar (Consul Cheney) 672

AMERICA.

North America:

Dominion of Canada:

Ontario:

Canadian cattle companies in the United States (Consul Parker, of Sherbrooke) .. 537, 538
Cattle most suitable for Canadian farmers (Commercial Agent Robbins, Ottawa) .. 538–540
Cattle and dairy farming in Ontario (Consul Pace, Port Sarnia) 540–546
Cattle of Ontario (Consul Howard, Toronto) 547–556
Cattle in Eastern Ontario (Consul Hazleton, Hamilton) 556–559
Cattle and cattle products in Southwestern Ontario (Commercial Agent Buffington) 559–564
Cattle in Prescott (Consul Slaght) 564–566
Cheese-dairying in Hastings County (Consul Prince, Belleville) 566–568
Cattle in Carlton County (Commercial Agent Robbins, Ottawa) 568, 569
Cattle in the Simcoe district (Commercial Agent James, Simcoe) 570

Quebec:

Cattle-raising in Quebec (Consul Parker, Sherbrooke) 571–574
Cattle in Gaspé Basin (Consul Holt) 574

Prince Edward Island:

Cattle in (Consul Worden, Charlottetown) 574, 575

Mexico:

Cattle-breeding in Northern Mexico (Consul-General Sutton, Matamoros) 576–585
Cattle-raising in the State of Chihuahua (Consul Scott, Chihuahua) 585–587
Cattle in the State of Nuevo Leon (Consul Campbell, Monterey) 587–589
Stock-raising in the State of Nuevo Leon (Consul Campbell, Monterey) 589–592
Cattle-raising in the State of Tamaulipas (Consul Smith, Nuevo Leon) 592–594
The breeding cattle of Northern Mexico (Vice-Consul Prigden, Piedras Negras) .. 594
Cattle-raising in Sonora (Consul Willard, Guaymas) 595
Cattle in Lower California (Consul Viosca, La Paz) 596

Central America:

Cattle-raising in Honduras 597–602

South America:

Argentine Republic:

Cattle industry of (Consul Baker, Buenos Ayres) 603–621

Brazil:

Cattle in (Consul-General Andrews, Rio de Janeiro) 630–632

Colombia (United States of):

Cattle on the plains of Bogota (Vice-Consul Boshell, Bogota) 633

Ecuador:

Cattle-breeding and products of cattle in (Consul Beach, Guayaquil) 634, 635

Peru:

Cattle in (Consul Lapoint, Chiclayo) 636

Uruguay:

Cattle and cattle-breeding in (Chargé d'Affaires Bacon, Montevideo) 622–629

Venezuela:

Cattle interest in (Consul Bird, La Guayra) 637, 638
Cattle supply of Maracaibo (Consul Plumacher) 638

	Page.
West Indies:	
Cattle in Bermuda (Consul Allen, Bermuda)	639
Cattle in San Domingo (Consul Simpson, Puerto Plata)	639, 640
Cattle and cattle products in Saint Thomas (Consul Smith)	640, 641

ASIA.

Ceylon:	
Cattle of (Consul Morey, Colombo)	655–659
American *vs.* Danish and French butter in (Consul Morey, Colombo)	677
China:	
Cattle in the Yang-tse-Kiang Valley (Consul Shepard, Hankow)	664–668
Cattle in Southern China (Consul Seymour, Canton)	668
Japan:	
Cattle in (Consul Jones, Nagasaki)	663
Java:	
Buffalo cattle of (Consul Hatfield, Batavia)	661, 662
Malaysia and Siam:	
Water buffalo of (Consul Studer, Singapore)	660, 661
Philippine Islands:	
Cattle in (Commercial Agent Voigt, Manila)	673
Syria:	
Cattle in (Consul Robeson, Beirut)	652–654

AUSTRALASIA.

New Zealand:	
Cattle of (Consul Griffin, Auckland)	642–650
Tasmania:	
Cattle in (Consul Webster, Hobart)	650
Victoria:	
Cattle in (Consul-General Spencer, Melbourne)	651

EUROPE.

Cattle-breeding in Europe and in the United States (Consul Tanner, of Verviers and Liege)	41–56
Scientific dairy instruments (James Long, Hetchin, England)	685, 688
Cream-separating machines (James Long, Hetchin, England)	688–691
Feeding on the soiling system (James Long, Hetchin, England)	701–703
Belgium:	
Cattle in (Consul Steuart, Antwerp)	359, 360
Breeds of cattle in (Consul Wilson, Brussels)	360–365
Cattle and cattle-breeding in (Consul Tanner, Verviers and Liege)	366–370
Belgian and Dutch milch cows (Consul Wilson, Ghent)	370–383
Belgian process for preserving meat and vegetables fresh (Dr. Closset's)	699–701
Farming in Belgium (M. François Flechet)	705–708
Denmark:	
Danish cattle (Consul Ryder, Copenhagen)	490–492
Angeln cattle (Consul Ryder)	492–495
Butter export of Denmark (Consul Ryder)	495–498
Union dairies in Denmark (Consul Ryder)	498–501
France:	
Cattle breeds of France and their products (Consul Williams, Rouen)	240–265
Division of land and cattle-breeding in France (Vice-Consul Martin, Marseilles)	266–272
Cattle-raising in the southwest of France (Consul Roosevelt, Bordeaux)	272–281
Normandy cattle (Consul Glover, Havre)	282–285
Cattle products in the district of the Marne (Consul Frisbie, Rheims)	285
Cattle in the district of Nice (Vice-Consul Vial, Nice)	286
French live stock (Official Catalogue of Paris Exhibition)	724–729
French cattle (from the Field newspaper)	729–734
French sheep (H. Kains-Jackson)	777
Germany:	
Breeds of cattle in Germany (Consul-General Vogeler, Frankfort-on-the-Main)	389–397
Cattle in Germany (Consul Schoenle, Barmen)	397–403
Cattle breeds of Germany (Commercial Agent Wamer, Dusseldorf)	404–408
Cattle in Prussia (Consul-General Brewer, Berlin)	408–413
Cattle in Oldenburg, Jeverland, and East Friesland (Consul Wilson, of Bremen)	413–425
Cattle in Saxony (Consul Mason, Dresden)	426–431
Silesian cattle (Consul Dithmar, Breslau)	431–438

Germany—Continued. Page.

Cattle of Thuringia (Consul Mosher, Sonneberg) 438–442
Voigtland cattle (Consul Bullock, Annaberg) 442, 443
Cattle-breeding in Wurtemberg (Consul Catlin, Stuttgart) 444–464
Cattle breeds of Baden (Consul Ballow, Kehl) 464–472
Cattle products in Baden (Consul Smith, Mannheim) 473–475
Bavarian cattle (Consul Harper, Munich) 475–480
Cattle in the Duchy of Brunswick (Consul Fox, Brunswick) 480–482
Harz cattle for the United States (Consul Fox, Brunswick) 482, 483
Cattle in the Grand Duchy of Hesse-Darmstadt (Commercial Agent Smith, Mayence) 483–487
Cattle in the Rhine province (Consul Spackman, Cologne) 487–489
Live stock in Bavaria, census of (Consul Harper, Munich) 709
Dairy association laws of Wurtemberg (Consul Catlin, Stuttgart) 691–694
Wurtemburg cattle laws (Consul Catlin, Stuttgart) 743–752
Domestic animals of Bavaria (Consul Harper, Munich) 753, 754

Holland:

Dutch cattle (Consul Eckstein, Amsterdam) 502–514
Cattle of Holland (Consul Winter, Rotterdam) 515–518

Hungary:

Meat and dairy cattle in (Consul Sterne, Budapesth) 527–536

Italy:

Cattle and dairying in Lombardy (Consul Crain, Milan) 324–329
Buffalo cattle of Terra di Lavoro (Consul Haughwout, Naples) 326–329
Cattle in Piedmont (Vice-Consul Dezeyk, Turin) 329, 330
Cattle in Tuscany (Consul Welsh, Florence) 330–334
White cattle of Tuscany (Consul Crosby, Florence) 334, 335
Cattle in Venetia (Consul Noyes, Venice) 335–358
Cheese and butter making in Italy (Consul Crain, Milan) 677–682

Malta:

Cattle in (Consul Worthington) 323

Russia:

Cattle-breeding in Russia (Consul-General Stanton, Saint Petersburg) 519–523
Cattle in the Baltic provinces (Consular Agent Bomboldt, Riga) 524
Cattle of Finland (Acting Consul Donner, Helsingfors) 525
Polish cattle (Consul Rawicz, Warsaw) 525, 526

Spain:

Cattle in Andalusia (Consul Oppenheim, Cadiz) 384–387
Cattle in Catalonia (Consul Scheuch, Barcelona) 387
Cattle in Galicia (Consul Carricarte, Corunna) 388

Switzerland:

Swiss cattle (Consul Mason, Basle) 287–297
Statistics of brown Schwitzer cattle (Consul Byers, Zurich) 298–303
Swiss cattle and dairy products (Consul Beauchamp, St. Galle) 303–320
Cattle in the district of Geneva (Consul Adams, Geneva) 321–323
Manufacture of Swiss cheese (Consul Adams, Geneva) 682–685

United Kingdom:

Cattle breeds of the United Kingdom (Consul-General Merritt, London) 57–78
Cattle breeds of the United Kingdom (James Long, Hetchin, England) 78–156
Select breeds of British cattle (Consul Packard, Liverpool) 156–172
Hereford cattle (Consul Lathrop, Bristol) 172–180
Herefordshire and Hereford cattle (John Kersley Fowler, Prebendal Farm, Aylesbury) 811–188
British breeds of cattle (Joseph Lay Faulkner, veterinary surgeon, South Milford) 188–205
Jersey cattle (Consular Agent Renouf, Jersey) 205–207
Cattle in Cornwall (Consul Fox, Plymouth) 207
Cattle in Scotland (Consul Wells, Dundee) 208–217
Scotch breeding cattle for the United States (Consul Leonard, Leith) 217–224
Cattle in Ireland (Consul Piatt, Cork) 224–228
Butter industry of Ireland (Consul Piatt, Cork) 229–231
Butter trade of Cork (T. J. Clanchy, Cork) 231–235
Butter industry of Ireland (evidence of William J. Lane, of Cork, before committee of House of Commons) 235–239
A Wiltshire diary record (James Long, Hetchin, England) 691
Transport of cattle (James Long) 694
British cattle markets (Consul Ryder, Copenhagen) 696–699
Mixed food for cattle (James Long, Hetchin, England) 703, 704
Sandringham, Prince of Wales's herd (Edmund Beck, agent) 710

United Kingdom—Continued. Page.

Cattle in the Weald of Kent (W. Morland, Kent) 711
Cattle and sheep in Bucks (John Treadwell, Bucks) 711
Prize breeders of British cattle (Sir B. T. Brandreth Gibbs) 712–715
Milk yield of sixty British cows (Consul-General Merritt, London) 715, 716
Position of English dairy farming in 1883 (Gilbert Murray) 716–720
Milking trials at the London Dairy Show (Consul-General Merritt, London) 720–722
Central Chamber of Agriculture 722
Daily increase in weight of various British breeds of cattle (Consul-General Merritt, London) 723
British prize cattle (Consul-General Merritt, London) 735–742
Breeds of sheep in the United Kingdom (Consul-General Merritt, London) 755–760
Breeds of pigs in the United Kingdom (Consul-General Merritt, London) 760–762
Cotswold sheep (H. T. Elwes, Cheltenham, England) 762, 763
Long-wool Lincolns (John W. Mackinder, Mere Hall, Lincoln) 763
Southdown sheep—history, breeding, and management (Henry Wood, Merton, Thetford) 763–772
Southdown sheep and Cambridgeshire farming (from the Field newspaper) 773–777
Weights of sheep at Islington (Mark Lane Express) 778–782
Sheep and mutton in 1883 (Live-stock Journal) 782–788
Sheep portraits (Consul-General Merritt, London) 788, 789
Berkshire pigs (Joseph Saunders and Alfred Ashworth) 789
Yorkshire pigs (Sanders Spencer) 789, 790
Black Suffolk pigs (J. A. Smith, Ipswich) 790

ILLUSTRATIONS.

BRITISH CATTLE.

1. DEVONS.

Plate. No.	Description.*	Page.
9	Cow, Pretty Face	109
24	Bull	157
25	Cow	157
343	Cow, Phlox	740
344	Bull, Sweet William	740
345	Cow, Temptress 8th	740

2. HEREFORDS.

10	Heifer, Leonora; head only; plate 350 is a full portrait of this animal	110
11	Ox	110
28	Bull, Fisherman. Owned by the Earl of Coventry	161
29	Bull. Owned by Mr. J. H. Yeomans, Stretton Court, Hereford	161
30	Cow. Owned by Mr. J. H. Yeomans, Stretton Court, Hereford	161
40	Bull, Romeo	174
41	Ox. A celebrated prize animal	174
42	Cow, Golden Treasure	174
43	Cow, Giantess	174
349	Bull, Thoughtful	740
350	Heifer, Leonora	740

3. SHORTHORNS.

5	Ox. Owned by Mr. Bult. First in his class at Islington	98
6	Heifer, Lady Wildeyes 15th. Owned by Lord Fitzhardinge	98
7	Cow, Lady Wellesley 2nd. Owned by Mr. Hawstorne	98
8	Cow, cross-breed, dairy	98
22	Bull. Owned by Mrs. Hutchinson, Catterick, Yorkshire	157
23	Cow. Owned by Mrs. Hutchinson, Catterick, Yorkshire. (This cow is erroneously designated "Devon" in portrait)	157
63	Bull, Foscoe, white. Gained first prize at the Highland Society Show, and second prize at the Royal Agricultural Show, England. Owned by Lord Strathallan, Auchterarder, Perthshire, Scotland	213
64	Cow, Rosa Bonheur, winner of first prizes at agricultural shows in Scotland and England. Owned by Lord Strathallan, Perthshire, Scotland	212
65	Bull. A prize animal, owned in Scotland	213
317	Bull. Duke of Underley	738
318	Cow, Lady Violet	738
319	Heifer, Lady Violet	738
320	Bull, Anchor	738
321	Bull, Telemachus	738
322	Cow, Lady Carew 3rd	738
323	Cow, Victoria	738
324	Cow, Maiden	738
325	Heifer, Gaiety 6th	738
326	Heifer, Stanwick Rose	738
327	Cow, April Rose	738
328	Bull, Duke of Howl John	738
329	Cow, Baroness Oxford 3rd	738
330	Bull, Duke of Leinster	738
331	Cow, Matchless 5th	738
332	Cow, Generous	738
333	Bull, Acropolis	738
334	Bull, Ninth Duke of Tregunter	738
335	Cow, Duchess 119th	738
336	Cow, Honesty	738
337	Cow, Beauty No. 22	738
338	Cow, Beauty No. 35	738
339	Cow, Red Cherry	738
340	Cow, Innocence 2nd of Naseby	738
341	Cow, May Duchess 15th	738
342	Bull, Sir Simeon	738

---

[*] Particulars relating to each animal, when omitted from the text, are given under this head. Where no particulars are given (either under this head or in the text) none were received from the consuls.

4. LONGHORNS.

Plate No.	Description.	Page.
2	Bull, Darewell. Owned by Mr. R. Hall	94
3	Cow, head of	94
4	Steers. First at Islington. Owned by Sir John Crewe	94
347	Bull, Prince Victor	740
348	Cow, Calke	740

5. RED POLLS.

1	Group. Bull, Davyson 3d; cow, Silent Lady; cow, Dolly	88
31	Bull. Owned by Hon. J. J. Colman, Carrow House, Norwich	162
32	Cow. Owned by Hon. J. J. Colman, Carrow House, Norwich	162
32	Cow. Owned by Hon. J. J. Colman, Carrow House, Norwich	162

6. SUSSEX.

12	Cow. First prize at Tunbridge Wells. Owned by Messrs. J. & H. Hessman	114
13	Heifer. Second prize at Tunbridge Wells. Owned by Mr. J. S. Hodson	114
26	Bull. Owned by Mr. John Plumer, Horsham, Sussex	160
27	Cow. Owned by Mr. John Plumer, Horsham, Sussex	160
351	Heifer. A representative animal	740
352	Heifer. A representative animal	740

7. POLLED ANGUS.

18	Bull, Englishman. Owned by Mr. S. Stephenson, Baliol College Farm, Long Benton, Newcastle-upon-Tyne.	139
19	Cow, Pride of Aberdeen, at four years of age. Owned by Mr. Stephenson, also	139
34	Bull. Owned by Mr. Clement Stevens, Sandyford Villa, Newcastle-upon-Tyne	164
35	Cow. Owned by Mr. Clement Stevens, Sandyford Villa, Newcastle-upon-Tyne	164
44	Bull, Prince of the Realm	210
45	Yearling, Favonia	210
46	Heifer, Favorite	210
47	Bull, Prince of the Realm, at fourteen months	210
48	Group of heifers, Kinochtry breed	210
49	Bull, Young Hero; bred by Mr. Hannay, of Gavenwood. Won first prizes at Turriff and Banf Shows; second prize at the Highland Society Show; plate at Turriff, &c. Brought $1,340 at public sale in 1883.	210
50	Heifer, Pride of Aberdeen (plate 19 shows the matured animal). Winner of prizes as calf, yearling, and two-year old. Bred by Mr. Hannay, Gavenwood.	210
51	Calf, Prospera Princess. Owned by Mr. Hannay	210
52	Heifer, Benefit. Won first prize at Huntly, in 1883. Calf of the celebrated prize cow Blackbird, of Coratchy, which was sold for $2,100.	210
53	Heifer calf, Vignette. First prize at Banf in 1883. Owned by Mr. Hannay, Gavenwood.	210
54	Bull calf, Allegro. Bred by Mr. Hannay. Owned by Mr. Geddes, Blaerinore, 1883. Sired by Young Hero.	210
55	Heifer. Bred and owned by Mr. Ferguson, of Kinochtry, Scotland	210
56	Bull, The Shaw. First prizes at Highland Show and Royal Northern Show at Aberdeen. Bred and owned by Mr. Ferguson, of Kinochtry.	210
66	Bull, Sir Maurice	223
67	Cow, Juno	223
68	Sybil 2d of Tillyfour	223

8. POLLED GALLOWAYS.

57	Bull. Prize winner at the Highland Society Shows	224
58	Cow. Prize winner at the Highland Society Shows	224
69	Bull, Harden	224
70	Cow, Clara	224
71	Heifer, Lalla Rookh	224

9. HIGHLANDERS.

61	West Highland Bull. First prize at the Highland Agricultural Society Show. Owned by the Earl of Seafield, Castle Grant, Grantown.	212
62	West Highland bull. Two-year old. Prize winner	212
72	West Highland bull. Duke of Athole's herd	224
73	West Highland cow. Duke of Athole's herd	224

10. AYRSHIRES.

16	Bull. First prize winner. Owned by Mr. Bartlemore	134
17	Cow. No. 91 at Islington. Owned by Mr. Drew	134
59	Bull. First prize winner at the Highland Agricultural Society Show. Owned by Mr. Parker, Nether Broomlands, Ayrshire.	212
60	Cows, Callyhill and Mate. Owned by the Dowager Duchess of Athole, Dunkeld. Considered very fine specimens of the breed.	212
353	Cow, Jane	740
354	Cow. (Representative dairy cow)	740

11. JERSEYS.

Plate No.	Description.	Page.
14	Cow. (A representative animal)	116
38	Bull. Owned by Mr. E. J. Arnold, Summerland House, Jersey	166
39	Cow. Owned by Mr. E. J. Arnold, Summerland House, Jersey	166
355	Heifer and calves. Prize winners	742
356	Cow, Velveteen	742
357	Cow, Alice	742
358	Cow, Longueville Belle	742
359	Cow, Coomassee	742
360	Cow, Luna	742
361	Cow, Lady Emily Foley 2d	742

12. GUERNSEYS.

362	Cow, Valentine 3d	742
363	Bull, Squire of Vauxbelets	742
364	Cow. First in her class at Reading	742
365	Cow, Elegante	742

13. WELSH CATTLE.

20	Ox. First in its class at Agricultural Hall. Owned by Major Platt	153
21	Yearlings. Owned by Mr. Bowden	153
36	Ox. Owned by Major Platt, of Bangor	166
37	Cow. Owned by Major Platt, of Bangor	166
366	Yearling bull and heifer	742

14. KERRY CATTLE.

15	Bull. From the Knight of Kerry's herd	129

15. SUFFOLKS.

346	Cow, Wild Rose	740

FRENCH CATTLE.

1. FLEMISH AND CROSSES.

74	Cow	240
75	Cow	240
76	Bull	240
77	Bull	240
78	Ox	240
79	Cow	240
80	Ox. Durham-Flemish	240

2. NORMANDY AND CROSSES.

81	Cow	243
82	Bull	243
83	Ox	243
84	Ox. Prize Durham-Switz-Cotentine	245
85	Ox. Prize Durham-Switz-Normandy	245
122	Cow	282
124	Milch cow. Norman-Cotentine	282
125	Cow. Durham-Norman	282

3. BRITTANY BREED.

86	Cow	246
87	Bull	246
88	Ox	246

4. PARTHENAISE BREED.

89	Bull	247
90	Cow	247

5. CHAROLAISE BREED.

91	Cow	248
92	Bull	248
93	Ox	248
94	Prize ox	248
95	Ox. Durham-Charolaise	248

6. LIMOUSINE BREED.

96	Bull	248
97	Prize ox	248
121	Beef cattle	278

7. MANCELLE BREED.

Plate No.	Description.	Page.
98	Cow	249
99	Ox. Durham-Mancelle	249
100	Ox. Prize, Durham-Mancelle	249

8. COMTOISE BREED.

Plate No.	Description.	Page.
101	Cow	250
102	A prize ox	250

9. FEMELINE BREED.

Plate No.	Description.	Page.
103	Bull	250

11. SALERS BREED.

Plate No.	Description.	Page.
104	Bull	250
105	Cow and calf	250

12. GARONNAISE BREED.

Plate No.	Description.	Page.
106	Bull	254
117	Bull	272

13. BAZADAIS.

Plate No.	Description.	Page.
107	Bull	255
118	Bull	274

14. LANDAISE BREED.

Plate No.	Description.	Page.
108	Bull. Racing animal	256
120	Bull	277

15. GASCON BREED.

Plate No.	Description.	Page.
109	Bull	257

16. BARETON BREED.

Plate No.	Description.	Page.
111	Bull	257

17. BEARNAISE BREED.

Plate No.	Description.	Page.
114	Cow	257

18. ALGERIAN BREED.

Plate No.	Description.	Page.
112	Cow	257

19. MISCELLANEOUS.

Plate No.	Description.	Page.
113	Cow. Gevaudan breed	258
119	Cow. Bordelaise breed	276
123	Cow. Holland breed	282

20. BREED NOT DESIGNATED.

Plate No.	Description.	Page.
301	French bull	728
302	French cow	728
303	French bull	728
304	French cow	728
305	French ox	728
306	French cow	728
307	French bull	728
308	French cow	728
309	French bull	728
310	French cow	728
311	French ox	728
312	French cow	728
313	French bull	728
314	French cow	728
315	French bull	728
316	French bull	728

SWISS CATTLE.

1. SPOTTED (SIMMENTHAL) BREED.

Plate No.	Description.	Page.
126	Bernese bull	289
127	Simmenthal cow	289
128	Black (spotted) Freiburg bull	291
129	Black (spotted) Freiburg cow	291

2. BROWN SCHWYTZER BREED.

Plate No.	Description.	Page.
130	Bull	292
131	Cow	292
133	Prize cow	292
134	Prize cow, true type	292
135	Prize heifer, true type	292
136	Heifer, true type	292
137	Heifer, true type	292
138	Heifer, fair type	292
139	Cow, variation from true type	292
140	Bull, true type	292

ITALIAN CATTLE.

Plate No.	Description.	Page.
141	Cow of Swiss breed; in Lombardy.* Prize	324
142	Bull, Jupiter. Piedmontese breed. Prize	326
143	Bull, Pertinace. Piedmontese breed. Prize	326
144	Bull, Napoli. Pugliese breed. Prize	326
145	Bull, Ghinassi. Pugliese breed. Prize	326
146	Bull, Tigro. Freiburg-Fruilana breed. Prize	326
147	Bull, Maestro. Mantua breed. Prize	326
148	Cow, Mantova. Swiss breed. Prize	326
149	Heifer, Anversa. Dutch breed. Prize	326
150	Ox, Fausta. Pugliese breed. Prize	326
151	Cows, Minerva and Chloe. Brittany breed. Prize	326
152	Buffalo d'Italia	328
153	A Piedmont bull	330
154	A Piedmont cow	330
155	A Piedmont cow	330
156	A Piedmont mountain bull	330
157	A Piedmont mountain heifer	330
158	Bull, Adam 2d. Chianina breed	334

BELGIAN CATTLE.

Plate No.	Description.	Page.
159	Belgian cow. Dutch breed	367
160	Flemish cow	367
162	Belgian cow	372
163	A herd of Belgian cows	373

SPANISH CATTLE.

[The pictures of these Galician oxen were taken at Corunna as the animals were being shipped to England.]

Plate No.	Description.	Page.
168	Galician ox; white; four years; price, $91	388
169	Galician ox; yellow; five years; price, $87.50	388
170	Galician ox; yellow; five years; price, $86.70	388
171	Galician ox; brown; six years; price, $83.75	388

GERMAN CATTLE.

1. NECKAR BREED.

Plate No.	Description.	Page.
172	Cow. Red, with white face and white lower legs	391

2. SIMMENTHALER.

Plate No.	Description.	Page.
173	Cow. Red, with white star on forehead	391
188	Cow	404

3. LIMBOURG BREED.

Plate No.	Description.	Page.
174	Cow. Yellow	391

4. TRIESDORF* BREED.

Plate No.	Description.	Page.
175	Cow. Spotted, red and white	392

* Erroneously printed Friesdorf on page 392.

5. ALB BREED.

Plate No.	Description.	Page.
176	Cow. Red, with white belly and lower legs	392

6. SCHWAB HALL BREED.

177	Cow. Dark red to brown; white face	392

7. DUTCH BREED.

178	Cow. Black and white; white forehead	392
187	Cow	404

8. MONTAFUNER BREED.

179	Cow. Black-brown, white stripe along the back	393
189	Cow	405

9. MIESBACHER BREED.

180	Cow. White, with red-yellow spots	393

10. PINZGAUER BREED.

181	Cow. Red, with white stripe from shoulder to rump	393

11. ALLGAUER BREED.

182	Cow. Yellow-brown	394
190	Cow	405

12. SCHWITZER BREED.

183	Cow. Dark brown; Black doe-Mouth	394

13. VOIGHTLAND BREED.

214	Cow. Color, chestnut brown; yellow tail tuft	443
212	Head of a Voightland bull	443
213	Head of a Voightland cow	443

14. ANGELN BREED.

184	Cow. Color, red-brown	395
197	Prize bull, Thomas	413
198	Prize cow	413

15. PODOLISCHE BREED.

185	Cow. Color yellow; long horns; originally from Southern Russia; meat cattle	395

16. MÜRZTHALER BREED.

186	Cow. Color, gray; link between the Steppe and Mountain breed	396

17. GLAN BREED.

191	Bull	406

18. OLDENBURG AND EAST FRISIAN BREED.

194	Wiltermarsh prize bull, Neptune	413
195	Wiltermarsh prize cow, Leanda	413
202	Oldenburg prize bull, Budjadinger 3d	419
203	Oldenburg prize cow, Alimuth	419
205	Oldenburg-Budjadinger prize bull	420
206	Oldenburg prize heifer, Ivest von Oldenburg	420
207	East Frisian prize bull, Amor; 3 years	420
209	East Frisian cow; a celebrated milker	421
210	East Frisian cow; Sieglinde, seven years old; a good milker	421
211	East Frisian bull. Owned by the Crown Prince	421

19. MESSKIRCH (BADEN) BREED.

215	Cow. Front view	472
216	Cow. Side view	472
217	Cow. Side view	472
218	Bull. Front view	472
219	Bull. Side view	472
220	Yearling heifer. Side view	472

20. HARZ BREED.

221	Bull. Five years old. Owned by Mr. Stahl, of Altenau, on the Harz	482
222	Cow. Six years old. Owned by Mr. Cronfaeger, of Clausthal, on the Harz	482
223	Cow. Seven to eight years old. Owned by Mr. Bohnhorst, of Clausthal, on the Harz	482

21. MISCELLANEOUS BREEDS.

Plate No.	Description.	Page.
192	A yoke of Bavarian working cattle	406
199	Bavarian prize bull	413
200	Bavarian prize cow	413
201	Pomeranian prize bull, Blondin	413
196	Breitenburg prize bull, Conrad	413
204	German Shorthorn prize cow, Alice	419
208	Polled Angus bull, Admiral; imported	420

DUTCH CATTLE.

Plate No.	Description.	Page.
224	Cow, Woutje. A celebrated breeder and milker	510

RUSSIAN CATTLE.

Plate No.	Description.	Page.
225	Cholmogovian cow. Black and white; five years old. Habitat, government of Archangel, northern group	524
226	Cholmogovian cow. Black; six years old. Habitat, government of Archangel, northern group	524
227	Cholmogovian cow. Red and white; six years old. Habitat, government of Archangel, northern group	524
228	Red and white ox; five years old; yields about 800 pounds of meat. Habitat, government of Archangel, northern group	524
229	Dun cow. Calved six times. Habitat, government of Vologda, northern group	524
230	Gray hornless cow. Nine years old; yields about 324 pounds of meat. Habitat, government of Vologda, northern group	524
231	Dark-gray hornless ox. Five years old; yields from 648 to 684 pounds of meat. Habitat, government of Vologda, northern group	524
232	Gray ox. Five years old; yields about 1,260 pounds of meat when in good condition. Habitat, government of Vologda, northern group	524
233	Black cow. Eleven years old. Habitat, government of Yavoslaff, central group	524
234	Red cow. Four years old. Habitat, government of Yavoslaff, central group	524
235	Native cow. Habitat, government of Kostroma, central group	524
236	Black and white cow. Five years old. Habitat, governmen of Kostroma, central group	524
237	Red and white bull. Three years old; yields about 720 pounds of meat. Habitat, government of Kostroma, central group	524
238	Black bull (white face and legs). Three years old; yields about 648 pounds of meat. Habitat, government of Kostroma, central group	524
239	Black and white cow. Five years old. Habitat, government of Viatka, central group	524
240	Black hornless cow. Five years old. Habitat, government of Viatka, central group	524
241	Black and white hornless cow. Seven years old. Habitat, government of Perm, central group	524
242	Black hornless cow. Three years old. Habitat, government of Perm, central group	524
243	White bull with red ears. Four years old. Habitat, government of Perm, central group	524
244	A Finnish bull	524
245	A Finnish cow	524
246	Skull, *Bos primigenius*	524
247	Skull, *Bos latifrons*	524
248	Skull of Yaroslaff bull	524
249	Skull of Yaroslaff bull	524
250	Polish bull	526
251	Polish cow	526
252	Polish bull	526
253	Polish bull	526
254	Polish bull	526

HUNGARIAN CATTLE.

Plate No.	Description.	Page.
255	Bull. White native	528
256	Cow. White native	528

CANADIAN CATTLE.

Plate No.	Description.	Page.
257	Jersey cow. Mary Anne of St. Lambert	557
258	Jersey cow. Oaklands Cora	557

MEXICAN CATTLE.

Plate No.	Description.	Page.
269	Cow	579
270	Oxen	579
271	Bull	579
268	Mexican cattle brands	579

BRAZILIAN CATTLE.

272 273	Native oxen and cart	630
274	Native cow	630

SINGHALESE CATTLE.

275	Half-breed bullocks and cart	656
276	Draught bullocks in Colombo	656
277	Family bandy	656
278	Tanjore draught ox	656
279	Half-breed draught bullock	656
280	Plowing with oxen in Ceylon	656
281	Hauling timber in Ceylon	656
282	Ceylon buffalo cart	656

SCIENTIFIC DAIRY IMPLEMENTS AND MACHINES.

259	Milk test: Specific gravity of milk from different breeds of cows. (Fig. 1)	563
260	Cream test: Cream by volume, from different breeds of cows. (Fig. 2)	563
261	Cream test: Cream by weight, from different breeds of cows. (Fig. 3)	563
262	Milk test: Agreement of specific gravity of milk with actual weight of cream. (Fig. 4)	563
263	Cream and butter test: Agreement of cream by weight, with butter, by weight, from milk of different breeds of cows. (Fig. 5)	563
264	Butter test: Butter from milk, by weight, from different breeds of cows. (Fig. 6)	563
265	Butter test: Butter from cream, from milk of different breeds of cows. (Fig. 7)	563
283	Milk-testing set: Lactometer, creamometer, and thermometer	685
284	Guevenne's original lactometer, or lactodensimeter	685
285	Creamometer on stand	685
286	German creamometer or cream-testing tube	685
287	Lactobutryometer on stand, with stopper	685
288	Feser's lactroscope	685
289	Copper bath, showing three pipettes and three lactrobutryometer tubes within	685
290	Acrometer for extracting fats; Professor Soxhlet's	685
291	De Lavel's Swedish separator; drum, milk chamber; cream chamber	688
292	H. C. Petersen's Danish separator	688
293	Fjord's regular, cream	688
294	Fjord's regulator—by this machine any percentage of cream can be skimmed by the Danish separator	688
295	Scale showing the value of each system	688
296	Vertical drum cream separator of Petersen, of Hamburg	688
297	Aarhus cream separator	688
298	Narskov centrifugal separator	688
299	Lefeldt cream separator	688
300	Lefeldt cream separator	688

BUTCHERING AND KILLING CATTLE.

114	How the Paris butchers cut up a beef	260
115	How the Lisle butchers cut up a beef	261
116	How the London butchers cut up a beef	261
132	Swiss method of killing cattle	295

MODEL FARM AND CATTLE HOUSES.

Plate No.	Description.	Page.
266	Plan of model stock building, experimental farm, Guelph, Ontario	503
267	Farm buildings of the future; plan illustrating principles in arrangements as taught at the Guelph, Ontario experimental farm	503
193	Plan of farm house and surroundings on the declivity of the Seven Mountains, Germany	406

MILK AND MILKMAIDS.

Plate No.	Description.	Page.
161	Delivering milk in Belgium	371
164	A Flemish milkmaid	374
165	A Brabant milkmaid	374
166	An Antwerp milkmaid	374
167	A Dutch milkmaid	374

ENGLISH SHEEP.

Plate No.	Description.	Page.
367	Oxford Down ram	788
368	Oxford Down ram, Hermit	789
369	Oxford Down ram, Campsfield	789

LETTER

FROM

THE SECRETARY OF STATE,

TRANSMITTING TO

The Speaker of the House of Representatives reports, in reply to a Department circular, from the consuls of the United States, on cattle and dairy farming and the markets for cattle, beef, and dairy products in their several districts.

JANUARY 28, 1886.—Referred to the Committee on Agriculture and ordered to be printed.

DEPARTMENT OF STATE,
Washington, January 26, 1886.

SIR: At the request of some of our leading stockmen, a circular, dated July 18, 1883, covering the question of cattle and cattle products in foreign countries, was transmitted to our consuls, with the view of receiving therefrom such information as might be useful to the stockbreeders and dairy farmers of the United States in their efforts to improve our native stock, and to develop a foreign market for our surplus cattle and cattle products. I have now the honor to submit herewith the reports received in answer to this circular.

The forms presented by the stockmen, and which were incorporated into the circular, were so contracted in scope and so technical in arrangement as to satisfy the Department that the consular responses thereto would not cover the many interests involved; hence some memoranda, in the form of suggestions and directions, were added. The principal points covered by these memoranda were as follows:

(1) The best methods of exporting cattle to the United States; the best animals to export; the best routes of export and the estimated cost for freight; the purchasing prices of the animals and the estimated expenses for attendance and food while *en route*.

(2) The total number of cattle in each district or country and the percentage of the several breeds; the percentage for the dairy and the butcher; the increase or decrease of stock, and the causes thereof.

(3) Whether the stock of each country is sufficient for home demands; if in excess of home demands, the countries to which the excess is exported; if insufficient for home demands, the countries from which the needed supplies are drawn.

(4) How much of these supplies, and their nature, is drawn from the United States; the best means for increasing the exports to each country from the United States.

In regard to that part of the general subject under consideration which deals with the breeds of cattle, their feeding, housing, and handling, the best breeds for importation into the United States and the best manner of importation hither, and the various other points connected therewith, and which from their nature, being altogether matters of detail, are incapable of being compressed into such statistical compactness as would render them available or useful in a short introductory letter, those interested are referred to the several reports, which are both exhaustive and valuable, being prepared in many instances by recognized authors and experts, or from information directly supplied by such. That portion of the subject, however, which deals with foreign meat and dairy-produce markets, our present share in supplying the same, and the best means for the enlargement of our trade therein, being more susceptible of profitable statistical analyses than cattle-breeding, the following figures are submitted, in the interest of our exporters of cattle and cattle products.

LIVE-CATTLE TRADE.

It would seem as if the cattle, meat, and dairy producers of the world—that portion, at least, which prosecutes advanced agriculture—look to the British markets for the consumption of their surplus products. Outside of our oleomargarine trade with Holland, and a comparatively small export of salted beef, tallow, butter, and cheese to Canada, the West Indies, &c., our trade in cattle and cattle products is with the United Kingdom, as the following statement will show:

Statement showing the exports of cattle and cattle products from the United States during the year 1884.

Description.	To the United Kingdom.	To all other countries.	Total.
Horned cattle	$17, 336, 606	$518, 889	$17, 855, 495
Fresh beef	11, 516, 369	470, 962	11, 987, 331
Canned beef	2, 542, 122	631, 645	3, 173, 767
Salted beef	2, 058, 383	1, 143, 892	3, 202, 275
Other beef	60, 028	7, 730	67, 758
Butter	1, 876, 341	1, 874, 430	3, 750, 771
Cheese	10, 508, 526	1, 155, 187	11, 663, 713
Beef tallow	2, 941, 008	1, 852, 367	4, 793, 375
Oleomargarine	209, 020	4, 633, 342	4, 842, 362
Condensed milk	203, 008	45, 321	248, 329
Total	49, 251, 411	12, 333, 765	61, 585, 176

In the column of exports "to all other countries" are products exported to Canada to the value of $2,635,418, a large portion of which was re-exported to England, and oleomargarine to Holland, which also found its way as "butter" to the British markets, as will appear further on, to the value of $4,127,827. This would reduce the exports to all other countries at least $5,000,000, and increase those to the United Kingdom by that amount. Our exports during the year may therefore be set down as follows: To the United Kingdom, $54,250,000; to all other countries in Europe, $3,200,000; to all countries outside of Europe, $4,108,176.

It will thus be seen that statistics showing the conditions which prevail in the British markets, and the means which must be taken to hold and enlarge our interests therein, cover, for all practical purposes, our commercial relations with the outside world, as far as our exports of cattle and cattle products are concerned. The other countries of Europe essay to supply their own wants in this regard, and mainly succeed in so doing, having a small surplus for export besides. It should, however, be borne in mind that many of those countries are relatively no richer in cattle and cattle products than the United Kingdom, but their consumption of meat food is very limited, while the British people are a meat-eating people; indeed, they may be looked upon as the only meat-eating people in Europe, for the general populations of the other countries regard meat as a luxury, to be enjoyed sparingly on rare occasions.

The same may be generally asserted, though in a more modified degree, in regard to the general consumption of butter and cheese. Hence, while the other countries of Europe offer limited fields for the consumption of our cattle products, fields which are, but which should not be, overlooked in our efforts to supply the imperial demands of the United Kingdom, we must continue to look upon the latter as our principal market, and direct our best efforts toward fulfilling all the conditions by which it is governed, and continue to give the British people superior products, at prices which will leave as little cause for dissatisfaction and as little room for successful competition as possible. We have done much to control the supply of the British market, but we have, in our anxiety to reach voluminous results, neglected many details, to our loss and to the advantage of those countries which have established themselves in British esteem, and which command a successful trade in the British market, by extreme care and attention in the preparation of their products—in fine, by specially catering to the tastes of the consumers.

Statement showing the number and value of cattle imported into the United Kingdom during the year 1884, *the countries whence imported, and their value per head, as compiled from British official statistics.*

OXEN AND BULLS.

Whence imported.	Number.	Value.	Value per head.
United States	139,213	$16,120,600	$115 79
British North America	59,054	6,123,600	103 69
Denmark	42,746	4,160,160	97 32
Portugal	17,903	1,866,240	104 24
Germany	17,310	1,681,560	97 14
Spain	17,482	1,589,220	90 91
Sweden	12,426	1,205,280	97 00
Holland	2,561	247,860	96 74
Norway	865	84,078	97 08
Channel Islands	131	21,578	164 72
West Africa	5	170	34 00
Total	309,696	33,100,346	106 88

COWS.

Denmark	44,167	$4,218,480	$95 51
Germany	7,182	628,398	87 49
Sweden	4,110	394,632	96 02
Channel Islands	2,160	256,608	118 53
British North America	1,977	195,858	99 07
Holland	1,123	86,508	77 03
United States	487	52,002	106 78
Norway	107	10,084	94 24
Total	61,314	5,842,570	95 29

CALVES.

Holland	41,354	$957,134	$23 14
Denmark	9,349	186,624	19 96
Sweden	3,371	81,793	24 26
Channel Islands	356	25,432	71 44
All other	67	928	13 85
Total	54,497	1,251,911	22 97

From the foregoing statement showing the imports of oxen and bulls into the United Kingdom—that is, butcher stock—it will be seen that American cattle, if we except the Channel Islands cattle, which are imported for breeding purposes, command higher prices than the cattle imported from any other country, and we may assume that the best butcher stock of the world is represented in that market. The cattle imported from Canada, although analogous to American cattle, are valued at more than $12 per head less than our cattle, while those of European countries are valued at from $25 to $18 per head less than ours, with the exception of Portuguese cattle, which only fall short $11.55 per head.

This, therefore, bears out some of our consuls in their assertions that American cattle are the best general cattle in the world. Having the finest cattle ranges and most favorable climate for cattle-raising, the superiority of our cattle, as asserted in the British markets, is surprising only to those who have been in the habit—persons who assume rather than reason—of connecting high-grade cattle with the Old World only. The superiority of our cattle and cattle ranges is nowhere better understood than by the advanced and intelligent cattlemen of Ontario. This is verified in many ways, but in no way more emphatically than by the fact that Canadian cattle companies, in order to keep up to the demands of the British markets—Canadian cattle falling far below American cattle therein—have been forced to leave Canadian pastures for those of the United States, as a report upon the subject from the consul at Sherbrooke will substantiate. The intelligent and sensible efforts of those companies for the improvement of their vast herds are worthy of deep study on the part of our cattlemen.

The Ontario Agricultural Commission, in the report of its proceedings published in 1881, refers in complimentary terms to the superiority of American cattle. Mr. A. J. Thompson, a large shipper of Canadian cattle to England, testified as follows before the commission:

> The animals that come from Kansas City are far superior to Canadian grain-fed cattle; there is no comparison between them. People have the idea that there is no breeding among the cattle in the Western States, but this is a great mistake, for these cattle are all pretty well bred.

A statement, attached hereto, has been prepared which shows the importations of cattle (cows and calves omitted) into the United Kingdom during the eleven years ending with the year 1884. These details embrace the beginning and development of our cattle and fresh-beef trade with that country, and are of special interest to our cattlemen and packers.

This statement goes to show that our exportations of cattle to Europe really began in the year 1877—previous exportations being more or less in the nature of experiments—and reached their maximum in 1880; the imports into the United Kingdom from the United States during that year amounting to $17,889,174, against $16,120,600 during the year 1884.

The magnitude to which this trade would have grown were it not for adverse legislation—legislation the result of fear lest cattle disease might be introduced into the United Kingdom through the free import of American cattle—which hampered the landing, and the handling and killing after landing, of the animals, would only have been limited by our capacity to supply the demand.

The changes which have taken place in the British foreign cattle trade during the decade ending with 1884, and the relative positions of the countries from which the cattle were drawn at the beginning and end of the decade, are shown in the following statement:

Statement showing the number of oxen imported into the United Kingdom during the years 1875 *and* 1884.

[The countries from whence imported are given in the order of their importance in 1884, the figures in parentheses showing their relative order in 1875.]

Whence imported.	1875.	1884.	Whence imported.	1875.	1884.
United States (10)	299	139, 213	Sweden (8)	3, 637	12, 426
Canada (9)	1, 212	59, 054	Holland (3)	27, 396	2, 561
Denmark (2)	29, 687	42, 746	Norway (11)	227	865
Portugal (5)	21, 632	17, 903	Belgium (7)	7, 139	....
Spain (4)	23, 850	17, 482	France (6)	8, 986	....
Germany (1)	50, 141	17, 310			

It will here be seen that of all the European countries which contributed in 1875 to the British cattle trade, Denmark and Sweden only show an increase in 1884. Germany, which held a good first place in 1875, has fallen to the sixth place in 1884, its exports in the latter year being not much over one-third what they were in 1875, while Belgium and France have fallen out of the trade altogether. It follows that were the United Kingdom dependent upon Europe to-day for its foreign meat supplies, the British people would have to eat less beef or pay far more for what they consume than they now pay. One principle seems to be established in the foregoing showing, viz, that the United Kingdom can rely no longer upon Europe for its foreign-cattle wants, and that the United States must, for some years at least, be looked to for the greater portion of such supplies.

THE FRESH-BEEF TRADE.

As the trade in fresh beef is so closely connected with the trade in live cattle, and as the former has so much bearing upon the latter as to make it impossible to discuss understandingly the one without taking the other into consideration, the following statistics concerning the fresh-beef importations into the United Kingdom are given:

Statement showing the quantities and value of the fresh beef imported into the United Kingdom from the several countries during the year 1884.

Whence imported.	Quantity.	Value.	Value per pound.
	Pounds.		*Cents.*
United States	90, 904, 128	$10, 724, 579	11. 80
Russia	3, 551, 184	352, 107	9. 92
Canada	2, 643, 872	320, 531	12. 12
Germany	711, 648	89, 409	12. 56
Australasia	308, 448	32, 843	10. 64
France	104, 272	17, 593	16. 88
Other countries	151, 648	16, 018	10. 56
Total	98, 375, 200	11, 553, 080	11. 74

This statement shows that we virtually monopolize the trade of the United Kingdom in foreign fresh beef.

The imports of fresh beef into the United Kingdom in 1874 amounted to about 3,773,464 pounds, of which 3,650,784 pounds were imported from Germany, and only 122,680 pounds from the United States. Our own official returns make no special mention of any exports of fresh beef before the year 1877, when 49,210,990 pounds—the whole export—were shipped to the United Kingdom. Our trade in fresh beef has sprung into sudden magnitude, having steadily increased from 49,210,990 pounds, valued at $4,552,523, in 1877, to 120,784,064 pounds, valued at $11,987,331, in 1884.

The British official returns place the following per-pound value upon the imports of fresh beef into the kingdom during the years 1880, 1881, 1882, 1883, and 1884:

Whence imported.	1880.	1881.	1882.	1883.	1884.
	Cents.	*Cents.*	*Cents.*	*Cents.*	*Cents.*
United States	11.27	11.48	12.06	12.22	11.80
Canada	11.03	12.51	11.80	12.04	12.12
Russia	....	....	....	10.84	9.92
Germany	13.31	11.56	11.71	12.91	12.56
Australasia	....	....	....	12.06	10.64
France	....	....	....	13.19	16.88

It will be seen that American beef maintained the lead of all countries from which meat is drawn in any quantity. The slight price decrease in 1884 can have no significance when the immense quantity imported from the United States (90,904,128 pounds) is taken into consideration.

Our consular reports a few years back repeatedly referred to the prejudice existing in Great Britain against American beef, while at the same time the British people were unknowingly proving the groundlessness for such prejudice by eating large quantities thereof under the name of prime English beef—a trick of the butchers, who had helped to create and maintain the prejudice referred to.

The consuls asserted that this prejudice, principally engendered and sustained by the butchers, whose interests it was feared would be injured by the American fresh-beef trade, required for its total dissipation only comprehensive and intelligent action on the part of our exporters in placing their meat properly before the British people, who would undoubtedly consult and conserve their own interests in the premises.

Central meat depots, with outlying shops in the principal cities of the kingdom, controlled and directed by British agents in the employ of the American shippers, or having an interest in the business, were suggested as the radical remedy for the immediate development of an almost unlimited trade in fresh beef.

Recent reports make no reference to this phase of the trade, and it is to be assumed that the British public have become more or less convinced that American cattle and American meats are the very best in the world, outside of, perhaps, their own selected cattle and beef. It may even be doubted whether the best forced-fed English beef is any better than the beef raised on our rich and succulent ranges.

The following extracts from a report written by the consul at Manchester in 1882 will illustrate this peculiar phase of our fresh-beef trade in England:

> The wide difference between the price English butchers pay our American exporters for their meats, as compared with the price they charge for the same at retail, leads me to again refer to the great need of the adoption of better methods for placing our meats on sale here.
>
> At present the English dealer makes an unusual profit out of the American meat supply. This is often done by misrepresenting the kind of meat he sells, for it is a common practice, I am credibly informed, to claim that the beef, mutton, &c., on sale

is all English, when, in fact, most of the weight on hand has just come from the American supply at Liverpool. Not long ago a case in point came under my own observation. I made inquiry of a retail butcher if he sold American meats, and he replied with some warmth, "No, sir, I could not sell it here." The same afternoon I was conversing with a gentleman, and incidentally mentioned what the butcher had told me. He laughed and said, "Two days ago I was coming down —— street in Manchester, and saw this same butcher drop a paper. I picked it up, and it was a long bill of American meat, and when he assured you he sold no American beef he forgot that *all* his stock that day was *American* beef, and *American only!*" This plain statement of a fact illustrates how easy it has heretofore been for the English retail dealer to cheat and deceive consumers as to the beef sold. The prejudice against American beef is largely a thing of the past.

And now that consumers are learning the tricks played upon them by butchers, it would be a wise plan, in my opinion, for American exporters of beef and mutton to take steps to compel fair dealing, to say the least, on the part of retail butchers here. Several years ago shops for the sale of American meats were opened in various centers, but owing to the hue and cry raised against them by the retail trade generally, and also on account of the prejudices with which consumers always regard a new source of supplies of food for this country, the plan did not prove a success. Besides, the supply was, owing to the uncertainty of the new enterprise, irregular—a state of things which no longer exists. I believe the present is a favorable time to repeat the experiment under wise and judicious management. Our meats have won their way everywhere, and there is now no good reason why our exporters should not receive at least 2 cents a pound more for their meat at Liverpool, leaving retail butchers here a round profit, and enabling the consumer to purchase the same at a reduction from present prices of from 2 to 3 cents per pound. A cheaper supply of good beef would insure an enormous increase in the quantity consumed, so that cheaper meat would be a great boon to many of the laboring poor, who now rarely eat beef on account of its expense. American meat would be as readily bought under its right name as it is now under a false name, and with this difference—the producer and consumer would each be benefited, where now only the retail dealer reaps an undue profit.

The statistics thus far given go to show that we monopolize, in the sense of supply, the trade in foreign fresh beef in the United Kingdom; and as it would seem to be more desirable for the United States to supply that market altogether with the product in this form, rather than in the form of live cattle, it is to be hoped that those most directly concerned will so perfect and enlarge their systems of preserving and handling as to do away altogether with what under the very best conditions must be a crude and troublesome trade—the shipment of live cattle across the Atlantic.

There can be no doubt that the fresh-beef form would also be more convenient and satisfactory to the British people, and save them all anxiety in regard to the introduction of cattle disease from the United States, of which they seem to stand in constant dread—otherwise there would be no necessity for laws governing the import of live cattle, and regulations for the control of the stock before and after landing, which, as before remarked, greatly retard the trade.

The fullest investigation into the conditions which surround this trade would seem to place the fault—if fault it be—for the shipment of live cattle to Great Britain, there to be converted into meat, instead of shipping from the United States in its meat form, at the doors of our cattlemen and beef exporters. The fact that we now ship 90,000,000 pounds of fresh beef annually to the United Kingdom is evidence of our ability to ship three times that amount, and with comparatively less trouble and expense than would be entailed by the shipment of live cattle to produce that amount of meat in England, besides the profit which would accrue to the United States from the slaughtering of the animals, the preparation of the meat, the hides, horns, hoofs, bones, offal, &c., all of which represents so much gold to our manufacturers and agriculturists.

LIVE CATTLE IN THE SEVERAL COUNTRIES.

The following statistics, mainly official, showing the number of cattle in the principal countries wherein cattle-rearing for meat and dairy purposes, or for either, is prosecuted, will enable our stockmen to appreciate the present and prospective conditions which affect this great industry both at home and abroad:

Cattle in the principal countries of Europe.

Countries.	Cows.	All other.	Total.	Number of cattle to each 1,000 inhabitants.
Russia	....	....	24, 088, 000	299. 9
Norway	741, 598	275, 019	1, 016, 617	528. 0
Sweden	1, 394, 731	796, 805	2, 191, 636	480. 0
Denmark	898, 790	571, 288	1, 470, 078	754. 9
Germany	8, 961, 221	6, 815, 481	15, 776, 702	341. 0
Holland	997, 839	456, 567	1, 434, 406	357. 5
Belgium	796, 178	586, 637	1, 382, 815	250. 5
France	7, 113, 242	4, 383, 011	11, 416, 253	303. 2
Italy	2, 366, 556	2, 416, 676	4, 783, 232	168. 1
Austria	4, 138, 625	4, 445, 452	8, 584, 077	351. 2
Hungary	1, 740, 399	2, 857, 144	4, 597, 543	283. 9
Spain	....	....	2, 904, 598	170. 5
Switzerland	552, 427	547, 573	1, 100, 000	372. 3
Portugal	....	....	520, 474	125. 1
The United Kingdom	....	....	10, 826, 705	298. 0
Great Britain	2, 124, 020	4, 473, 934	6, 597, 954	210. 0
Ireland	1, 417, 431	2, 811, 270	4, 228, 751	859. 8
Total principal countries	....	....	92, 093, 136	283. 9

The statistical rules usually applicable for the deduction of results from almost any general industry are of very little practical use when applied to the cattle industry of Europe. The United Kingdom and Russia may be cited in illustration. The former is the largest consumer of foreign cattle among the nations of the world, while the latter is a country upon which the former expects in the very near future to draw for a large portion of its foreign meat supply; yet the United Kingdom has within a fraction of as many cattle as Russia to each 1,000 inhabitants, and if we take the quality of the stock of both countries into consideration—the native breeds, which constitute the general stock of Russia, yielding, according to Consul-General Stanton, "only from 252 to 288 pounds of coarse, unsavory meat"—the odds are largely in favor of the United Kingdom.

Spain, which exports largely to the United Kingdom, has only 170.5 cattle to each 1,000 of its inhabitants; Portugal, with much less than one-half the cattle per capita of the United Kingdom, is another heavy exporter; while France, with a fair average cattle supply—303.2 to each 1,000 inhabitants—imports, over and above its exports, from 70,000 to 75,000 head of cattle per annum for consumption. Consul Williams, of Rouen, says of the beef consumed in France one-tenth is imported. The same consul says that France imports beef cattle in large numbers from Italy; yet Italy has the lowest cattle census of the countries of Europe—that is, according to population—Portugal excepted, viz, 168.1 to each 1,000 of its inhabitants.

Among the many conditions which prevail and which influence the interests of the several countries, in so far as those interests come into conflict with the cattle and cattle products of the United States in foreign markets, the following may be cited:

(1) The purposes for which the cattle are bred and reared—whether for the dairy or the butcher.

(2) The quality of the cattle.

(3) The home consumption of meat and dairy products.

Spain, Portugal, and Italy are light consumers of these products; hence, with their very low stock rate, their ability to export cattle.

Switzerland, France, Holland, and Belgium are dairy countries; that is, the dairy is the principal interest and the butcher but an incident.

Austria and Hungary have fair cattle supplies, but their export is very limited. This, however, is due principally to the stringent cattle laws of Germany—laws enacted for the protection of German cattle from the introduction of disease.

The exporting cattle countries of Europe are Denmark, Portugal, Spain, Germany, Holland, Sweden, and Russia. From the arbitrary conditions which surround the industry in these countries, and in view of the unlimited fields for its development outside of Europe, it does not appear as if the future held out much promise for cattle-breeding, for export at least, in the Old World.

The United Kingdom being the only country in Europe which imports cattle and fresh beef from countries outside of Europe, such imports may be regarded as those which Europe cannot supply. The international imports and exports between France, Italy, Switzerland, Belgium, Holland, Austria-Hungary, and Russia are sufficient unto themselves, with a small surplus for export to England. This surplus was as follows in 1884:

Cattle.—From Germany, 24,492 head; from Holland, 3,664 head.

Fresh beef.—From Russia, 3,551,184 pounds; from Germany, 711,648 pounds; from France, 104,272 pounds.

This, it will be seen, is a very small surplus for so large a portion of the Continent, and a population of about 250,000,000.

The other countries of Europe, Sweden, Norway, Denmark, Spain, and Portugal, export about 140,000 head of cattle annually. It is to these that Great Britain looks, outside of Ireland, for any regular supply of European cattle.

The total annual wants of the United Kingdom, based upon the assumption that its importations cover its wants, may be estimated at 480,000 head of foreign cattle, or their equivalent in fresh beef. This estimate is based on the following calculations: In 1884 the importations were 61,314 cows, 309,696 oxen, 98,375,200 pounds of fresh beef, and 54,911 calves.

The value of the fresh beef, as may be seen on reference to the statistical table heretofore given, is a little over one-third the value of the oxen, and it is therefore assumed that the 98,375,200 pounds of fresh beef represented one-third the number of oxen imported. The greater number of the oxen and nearly all the beef being American, gives additional assurance that this estimate is a very close approximation to the real figures. The value of five calves equaling the value of one ox, this import is equivalent to 5,000 oxen.

The total number of horned cattle, or their equivalent as above, imported into the United Kingdom from European countries during the year 1884 amounted to about 180,000 head, leaving 300,000 head to be supplied by countries outside of Europe. These were drawn from the following countries, fresh beef being converted into cattle as before: From the United States, 234,700 head; from Canada, 64,031 head; from all other places, 1,269 head.

It thus appears that nearly one-half of all the foreign fresh beef consumed in the United Kingdom is drawn from the United States.

The foregoing estimates do not include the imports of meat "preserved otherwise than by salting," under which designation considerable quantities of "jerked" or dried beef from South America, and canned and smoked beef from the United States and Australasia, are imported, as witness the following statement:

Imports into the United Kingdom during the year 1884 *of meat preserved other than by salting.*

Whence imported.	Quantity.	Value.	Value per pound.
	Pounds.		*Cents.*
United States	29, 098, 536	$3, 476, 642	11. 96
Australasia	14, 399, 728	1, 502, 697	10. 44
Belgium	1, 416, 128	958, 499	67. 76
Uruguay	2, 614, 976	403, 385	15. 42
Canada	1, 564, 304	175, 237	11. 20
Argentine Republic	459, 984	82, 275	17. 89
France	245, 392	61, 892	25. 26
Russia	153, 104	30, 166	19. 71
Norway	158, 592	20, 572	12. 93
Germany	101, 360	20, 363	20. 06
Holland	117, 600	20, 052	17. 07
Brazil	169, 536	26, 652	15. 73
All other	10, 640	1, 640	15. 41
Total	50, 509, 880	6, 780, 072	11. 46

Here, as in cattle and fresh beef, the United States largely leads, followed in quantity by Australasia, Uruguay, Canada, Belgium, &c., respectively.

Assuming that the future wants of Europe will increase proportionately with the increase of, say, the last fifteen years, and that the increase in its cattle, under the most favorable conditions, cannot be expected to keep pace with the expected increase of population and the constantly increasing use of meat foods among the people—an increase principally due to the fact that the exports from the United States and other non-European countries are bringing meat foods more and more within the purchasing power of the general classes—it may serve a practical purpose for our stockmen, packers, and exporters to study the statistics of the countries which in the near future will be likely to compete with American meats in the British markets—not only in the British markets, but in those of nearly every country in Europe, for it is only a matter of detail in the perfection of the methods for the preservation of fresh beef, and its quick and regular transportation from distant countries, when the breeding and rearing of cattle for meat purposes will be wholly unprofitable, if not practically impossible, in the greater portion of Europe.

The latest official returns and estimates of the number of horned cattle in the principal cattle-rearing countries outside of Europe give the following results:

Countries.	Total number of cattle.	Number to every 1,000 inhabitants.
United States	45, 170, 000	821. 3
Brazil	20, 000, 000	1, 860. 7
Argentine Republic	12, 000, 000	4, 724. 0
Uruguay	8, 000, 000	11, 428. 6
Canada	1, 925, 000	442. 0
Australasia	8, 153, 000	2, 777. 0
Total	95, 248, 000	1, 288. 9

The figures in this statement show that there are over 3,000,000 more horned cattle in the six countries given, with a population of about 76,000,000, than there are in the principal countries of Europe—practically the entire continent—heretofore given, with a population of 324,000,000.

In regard to the vast herds of cattle in the Argentine Republic, Uruguay, and Brazil, it may be said, as a rule, that they are at present only valuable for their hides, horns, tallow, &c., very large numbers not being available even for these products, owing to their distance from the seaboard and the lack of transportation facilities. A striking illustration of these conditions is given by the consul-general at Rio de Janeiro, who reports that, notwithstanding the 20,000,000 head of cattle in the Empire, 54,000,000 pounds of dried beef were imported into that city (during the year in which his report was written) from Uruguay and the Argentine Republic. The conditions which prevail in the Argentine Republic are not much better than those which prevail in Brazil, Consul Baker reporting that, with its 12,000,000 cattle, neither milk, butter, nor cheese is produced in the country, and that the beef is of execrable quality.

Cattle in the Argentine Republic and in Uruguay are bred and slaughtered almost wholly for their hides, the exports of which numbered 1,910,218 for the Argentine Republic alone in 1883.

With the increasing demand for beef in Europe, it cannot be very long before the waste beef of South America will be more or less utilized in that direction. The capitalists of Europe, it appears, are already contemplating the import of fresh meats from the Argentine Republic, for our consul at Mayence, in a report dated September 1, 1885, transmits the following clipping from a leading German trade journal:

FRESH-MEAT TRADE WITH ARGENTINE.

The proposal to establish a company to carry on the importation of fresh meat from Argentine is being taken up in various quarters. Hamburg is to be the chief European depot, and 3,000,000 marks (about $700,000) are proposed as the capital. It is contended that there is a great opening in Germany for a concern which will provide cheap food, and especially flesh, for the people. The La Plata states, and Argentine particularly, are especially eligible for the supply of stock on a large scale. A beginning is to be made with mutton. In the Argentine Republic alone the flocks of sheep number 80,000,000 head. The meat will be brought in cold apartments, the machinery for the Argentine refrigerating establishment being obtained in Germany. German refrigerating machines have proved their efficiency. Recently Herr A. Neubecker, engineer, of Offenbach, made experiments attaining 15° of cold, and after six weeks the object still showed 8°, while for the transport by ship 1° is sufficient.

The consul, in transmitting this "news item," pertinently asks why our people cannot supply some of this "cheap food, especially flesh, for which there is said to be a great opening in Germany."

During the year 1884 we exported over 120,000,000 pounds of fresh beef, of which 115,000,000 pounds went to the United Kingdom, and not a single pound to any other country in Europe. This would seem to imply either one or all of three points, viz, that our exporters have overlooked the German market, that our beef is too dear for that market, or that there is no "great opening" in that market for foreign fresh beef. The second would seem to be the true point, else why should a syndicate be formed for experimenting in Argentine beef, while American beef, beyond the experimental phase, is within easy reach.

In regard to Australasia, noted for its valuable breeds of cattle, as well as for its intelligent cattle-breeding, it may be said to have passed the experimental stage in its exports of fresh beef to the United Kingdom, as the exports thereto of 308,000 pounds in 1884 would seem to imply. The imports of fresh beef into the United Kingdom from the United States during the year 1875 were only a little greater than those for Australasia in 1884.

The first imports into the United Kingdom of fresh beef from Russia are recorded for the year 1883, viz, 2,462,432 pounds. For 1884 the imports amounted to 3,351,184 pounds, an increase of 889,752 pounds. The initiatory effort in this case is British—British capital and British direction—and great hopes are entertained of enlarging the trade.

It will be noted, in the table showing the imports of fresh beef into the United Kingdom, that the Russian product is valued at 9.92 cents and the American at 11.80 cents per pound. The superiority of the American beef fully warrants this difference in price; but it must not be forgotten that a penny per pound is a matter of considerable moment to the working and trades classes of the United Kingdom, and will go far towards glossing over inferiority in quality. This question of cheapness exerts a controlling influence in every country in Europe, and the country which can supply the cheapest food products can always command an almost unlimited market therein. Our producers, while maintaining the high quality of their products, must never lose sight of this point.

Assuming that in the near future our stockmen and slaughterers will have to contend more or less with Australasia, the Argentine Republic, Russia, &c.—Canada being already an important competitor—for the beef trade of Europe, the question naturally presents itself, how will such competition affect us?

With the present magnificent condition of our vast herds; their superior quality as beef-makers; the intelligence which governs and guides every movement from the plains to the seaboard; our almost perfect railway system, which insures quick transport; the nearness of Europe to our shores, and the unlimited steamship conveyance always available, it does not seem possible that any other country can overmatch us in the European markets. The only drawback to our export trade which can arise is the possibility of our home demands increasing faster than our supply, for the home market is the controlling influence. Whatever may be the results to us and to the other countries which are preparing to enter into this trade, the result to the United Kingdom must be an abundant and cheap supply of beef, for the surplus beef cattle of the world are ever on the move towards London.

DAIRY PRODUCTS IN EUROPE.

Those portions of the consular reports which treat of dairy farming in Europe seem to cover every point contemplated in the Department circular, and they must prove of great interest and value to our dairy farmers. It would be impossible, even were it necessary, to condense their various interesting descriptions of European dairy farming, from the care of the cattle to the manufacture of butter and cheese, and the conditions which surround and influence the industry, from its inception to the disposal of the products. The reports to be fully appreciated in this regard must be read in detail, for the different parts of the subject are dwelt on to minutia, leaving very little for assumptive speculation.

The only phase of the interest which seems to demand any treatment here is, as in the case of cattle and beef, that which deals with the European butter and cheese markets, our share therein, and how to enlarge that share.

What was said of the cattle surplus of the world finding a market in the United Kingdom is equally true of butter and cheese. The conditions which govern that market may therefore be said to govern all other markets; at least this holds good so far as our exports of dairy products to Europe are concerned.

The following statement shows the amount and value of butter and butterine—for, strange to say, the British customs returns do not distinguish between butter and oleomargarine—imported into the United Kingdom during the year 1884:

Butter and butterine imports.

Whence imported.	Quantity.	Value.	Value per pound.
	Pounds.		*Cents.*
Holland	124, 924, 128	$24, 285, 575	19. 44
France	57, 121, 008	14, 077, 539	24. 64
Denmark	37, 527, 504	9, 761, 052	26. 01
Germany	16, 177, 280	4, 180, 251	25. 84
Sweden	11, 404, 064	2, 887, 384	25. 32
United States	11, 231, 472	2, 179, 982	19. 41
Canada	6, 208, 944	1, 243, 028	20. 02
Belgium	6, 740, 272	1, 348, 848	20. 00
Norway	3, 489, 472	610, 564	17. 51
Russia	1, 484, 560	202, 536	13. 64
Australasia	508, 480	93, 924	18. 47
Italy	152, 432	36, 562	23. 92
Channel Islands	100, 464	25, 685	25. 57
British East Indies	161, 168	25, 146	15. 60
Other countries	17, 584	3, 115	17. 72
Total	277, 248, 832	60, 961, 191	21. 99

It will be noted that Danish butter leads all foreign butter in price per pound in the British market, being higher than even the celebrated Channel Islands butter. This is a fine tribute to what may be called a national effort in this leading industry of Denmark, for Government and people seem to be united in the determination to combine all the advanced appliances for the manufacture of this product with the utmost care and selection of the stock, cleanliness, and care in handling the milk, cream, and butter, and putting the latter on the British market in the most acceptable condition. Next to Denmark, the products of Germany, Sweden, and France stand very high in the British market.

The comparatively low place occupied by the product of Holland should not detract from the noted dairy farmers of that country, it being wholly due to the fact that a great portion of the imports therefrom into the United Kingdom is oleomargarine, or imitation butter. Consul Ryder, in his report on the butter export of Denmark, calls attention to this fact, and the Irish butter-makers, as will be seen on reference to the report from Consul Piatt, of Cork, protest that the Dutch manufacture butterine, or oleomargarine, properly speaking, to imitate Irish butter, in counterfeit packages, and that it is largely sold as Irish butter in England, and even in Ireland.

To properly estimate the amount of this so-called "Dutch butter" imported into the United Kingdom, we have only to compare the imports from Holland in 1877, before oleomargarine had become an industry in that country, and the imports during the year 1884. In the former year the imports were 41,679,085 pounds, against 100,128,032 pounds in 1884. In the former year the British imports of French butter amounted to 16,000,000 pounds more than the imports of Dutch butter, while in 1884 Dutch butter led the French by nearly 44,000,000 pounds. It is, therefore, safe to assume that fully 50,000,000 pounds of the butter imported into the United Kingdom from Holland in the year 1884 was oleomargarine or imitation butter.

In view of the prejudice which exists in Europe against American products, and the belief which prevails, more or less, among the several peoples that adulteration and counterfeiting of food products are more rife in the United States than in the Old World, the open manufacture of oleomargarine into imitation butter, the counterfeiting of well-known brands, and the flooding the British markets therewith, without exciting any special wonder, is most significant. In some the United States we have laws regulating the manufacture of oleomargarine, which laws insist that the product must be plainly branded according to its nature, so that people who so desire can purchase and use it understandingly. That it is permitted to be imported into the United Kingdom under the name of butter, and sold as such, must have a very injurious effect on the legitimate butter trade.

Turning to our exports of butter and oleomargarine (for the distinction is clearly made by our customs), we find that during the year 1884 Holland took of our oleomargarine oil 33,173,849 pounds, valued at $4,127,827, an average of 12.44 cents per pound. Our total exports of oleomagarine for the year amounted to 39,321,000, valued at $4,842,000, or 18,693,626, pounds, and $1,091,229 in excess of our butter exports for the year. Of our exports of oleomargarine not taken by Holland, 2,865,783 pounds of the oil went to Belgium, 1,967,263 pounds of the oil and 421,316 pounds of the imitation butter (the oleomargarine exports being subdesignated imitation butter and the oil by our customs) went to the United Kingdom, and 1,062,360 pounds of the imitation butter to Canada.

There need be little doubt that the greater portion of the export to Holland was converted into "Irish" and "English" butter and consumed as such by the British people. In this connection it is worthy of note that the exports from Holland to the United Kingdom, of which at least one-half was composed of this imitation butter, are valued by the British customs at a fraction per pound more than the real butter imported from the United States.

The decrease in the consumption of American butter in the United Kingdom is noteworthy. The imports thereof in 1879 amounted to 33,231,472 pounds, valued at $6,041,466, against 11,231,472 pounds, valued at $2,179,982, in 1884. It is more than probable that this decrease was largely due to the increase in our home consumption, prices in the home market, especially for first quality butter, being more satisfactory than the prices prevailing in the United Kingdom. The decrease was certainly not due to any lessened demand for foreign butter in Great Britain, for the imports during the year 1884 were 15,000,000 pounds in excess of those of 1880; and the fact that so much inferior butter or substitute for butter finds a growing market therein goes to prove that quality has no further bearing on the trade than value in the British market.

The fact that American butter is valued at 6.60 cents per pound less than the Danish, 6.43 cents less than the German, 5.91 cents less than the Swedish, 5.23 cents less than the French, and even a fraction less than the Dutch, one-half of which is imitation butter, should appeal to the pride as well as the profit of our dairy farmers. The high position attained by the Danish, German, and French butter in the British market is the result of special preparation for that market, and the reports of the consuls from those countries show the great care taken in its manufacture, so that all the requisite conditions may be complied with.

It may be said of the British market that it offers an almost unlimited field for high and low grades of butter. As the Dutch and Belgians, with their imitation butter—for the Belgians, it would also appear, largely manufacture oleomargarine for export to England—will, it is more than likely, be able to supply the low-grade product, we can scarcely hope, even if we so desired, to compete for this trade. The field for high-grade butter is, however, open to our dairy people, and there is no good reason why they, with more favorable primary conditions than can possibly exist in any of the European countries, should not prepare and place upon the British market butter which would stand on a par with the best Danish product. They should study the reports on Danish dairy farming concerning this great industry, and thus learn that the secret of Danish success lies altogether in complying with the laws governing success. If our dairy farmers essay foreign markets at all, they should cater to the tastes of those markets, and it will pay better, even at the expense of more labor and time, to export first-class than inferior butter carelessly made, carelessly packed, and carelessly placed on the markets. The 11,231,472 pounds of American butter imported into the United Kingdom from the United States during the year 1884 at the price received for Danish butter would have yielded our dairy farmers nearly $750,000 more than was realized therefrom. This large sum can be legitimately charged to indifference on the part of our dairy farmers. This is not the real cost of our indifference, however, for had we catered for the British markets, after the manner of the Danish dairy farmers, our exports would have been fourfold what they were in 1884. Thus some idea may be formed of the consequential damages which have resulted from our remissness in this one industry, which, as said before, is surrounded by more favorable conditions in the United States than in any other country.

In this connection, the attention of our dairy farmer is directed to a report on the Irish butter trade, transmitted by the consul at Cork. As Cork is the chief center of the dairy interest of Ireland—the butter being almost wholly manufactured for the London market—and as Irish butter holds a very high place in English esteem, this report, with its accompanying papers, is of special value.

A table in this report gives the prices of the finest butter in the Cork market for forty years, viz, 1841 to 1881, from which it appears that during the decade ending with 1851 butter averaged 84 shillings per hundred-weight (18.2 cents per pound); during the decade ending with 1861, 104 shillings per hundred-weight (22.6 cents per pound); during the decade ending with 1871, 116 shilling per hundred-weight (26 cents per pound); and during the decade ending with 1881, 131 shillings per hundred-weight (27.9 cents per pound); an increase in the forty years of 47 shillings per hundred-weight (10.2 cents per pound).

In 1881 Danish butter was valued in the English customs at 26.25 cents per pound; in the same year, as the report under consideration shows, Irish butter sold in the Cork markets at 28.8 cents per pound. The costs and charges incident to export must be added hereto to arrive at an estimate of its value in the English market. These figures would go to prove that Irish butter brings the highest price of all foreign butter in the London market. One of the inclosures in Consul Piatt's report deals at length with "Irish preserved butter," the writer, an expert in this product, claiming for this particular article great keeping qualities.

Consul Piatt, in referring to this butter, says:

> In connection with the subject of canned butter, it may be well to direct the attention of those in the United States interested herein to the opportunity which I am told exists for a large development of American enterprise with respect to this class of butter. Within seven or eight years, France, Germany, and Denmark have, by the adoption of the system of packing butter in hermetically sealed cans, each containing 1, 2, 3, 7, 14, or 24 pounds of butter, secured the entire or about the entire trade of supplying the ships of the world. I believe that the American creamery butter is eminently suitable for this particular branch of the export butter trade. If this butter were packed and sealed in cans similar to those exhibited by Mr. Clanchy, which preserve the butter fresh and sweet for a long period in any climate, immediately on being made at the creameries, nothing, so far as I can see, is to prevent its use in supplying the immense foreign shipping trade of our country. Whereas, all vessels going from Europe to America take with them a supply for the double voyage, it would be quite practicable, if this enterprise were introduced in the United States, to secure the entire trade for the American exporters. The United States ought to be able to compete most successfully with Europe for this trade, inasmuch as all dairy products can be produced so much cheaper with us than on this side of the Atlantic.
>
> For the large passenger steamships the finest butter is utilized, and also for export to countries where the consuming population require and can afford to pay for it, such as India, Japan, China, Australia, and South America, and countries bordering on the Mediterranean.
>
> For merchant shipping and for the poorer classes of the population in the above-named countries, a second and third quality of butter is good enough, and it is for the inferior qualities that the United States, as would appear from published market reports, require a greater outlet than for the products of the best dairies, inasmuch as the American markets are continually glutted with stock of this sort, chiefly owing to the inroads which the improved manufacture of butterine has made upon the markets hitherto available for the consumption of cheap genuine butter. Since merchant vessels use chiefly butter of the third quality, it will be seen that the markets for large quantities of this class of butter might be found if the canning system were adopted for the supply now furnished, for the most part, by European exporters.

From a statement, herewith submitted, showing our butter exports for eleven years, 1874 to 1884, both inclusive, it appears that this export has increased nearly fivefold in quantity during that period. The price per pound was, however, nearly 7 cents greater in 1874 than in 1884. On turning to the butter import into the United Kingdom for those two years it is found that the average price per pound in 1874 was 24.24 cents, and for 1884 (omitting the import from Holland wherein imitation butter predominated) the average price was 24.70 cents per pound. Thus the decline in value in American butter during the eleven years under consideration must have been wholly due to deterioration in quality. In this connection it should be remembered, however, that our first-class butter finds as good a market at home as in any foreign country, and it may be assumed that this fact alone accounts for the decline in the price of American export butter in 1884, as compared with the year 1874.

Our exports of butter to Europe during the eleven years increased nearly ninefold in quantity, this increase being wholly dominated by our exports to the United Kingdom and to Germany.

The export in 1884 of American butter to Denmark and Sweden (421,377 and 370,371 pounds respectively) is worthy of attention, being our first recorded butter exports to these countries.

It would be interesting to ascertain whether this product was imported into those butter-exporting countries for consumption or to be worked over for the English market. As the latter was more than likely the real purpose of import, it becomes a question for our dairy farmers whether, if it pays the Danish and Swedish butter makers or assorters to import American butter, manipulate it over and re-export the same to England at profitable prices, it would not pay them to so manipulate it in the first place as to leave nothing for foreign "butter doctors" to realize from any subsequent handling? If our butter can be so manipulated as to sell in London as Danish and Swedish butter, it must be, in its finished state, as good as Danish or Swedish butter, or the factors of those countries would not risk their good names by placing it before the British public with their brands thereon. It necessarily follows that our own dairy farmers can turn out our whole product for export of as good quality as either Danish or Swedish butter, if they only take the necessary time and care in all the details of manufacture.

It will be seen that our butter export to Canada (which is doubtlessly largely re-exported to Great Britain), the British West Indies, the French possessions in America, the Spanish West Indies, the United States of Colombia, and Venezuela, is of considerable volume and value. The fact that we export about one-half as much butter to countries on this continent as we do to Europe is significant, and as this field is capable of being largely developed it is worthy of the special attention of our dairy farmers.

In this connection it is to be assumed that canned butter, put up after the manner of Irish butter as reported by our consul at Cork, would be better suited for the West Indian and South American markets than our butter packed and shipped in its present form.

Our butter exports to Africa and Asia are, as might be expected, of little account. These continents do not consume butter in its American and general European form to any appreciable extent. To win any trade therein would require from our dairy farmers special preparation and special packing. The reports from these continents will enable those directly concerned to appreciate the conditions which are called for in this connection.

THE FOREIGN OLEOMARGARINE MARKET.

Exports of oleomargarine from the United States during the year 1884.

Exported to—	Imitation butter.		The oil.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Pounds.		*Pounds.*		*Pounds.*	
Germany	30,790	$2,605	96,551	$11,866	127,341	$14,471
Holland	....	....	33,173,819	4,127,827	33,173,819	4,127,827
Belgium	1,520	175	2,864,263	358,798	2,865,783	358,973
United Kingdom	421,316	47,864	1,545,947	161,156	1,967,263	209,020
Canada	1,001,803	107,175	60,566	6,159	1,062,369	113,334
Denmark	....	....	32,614	4,200	32,614	4,200
Elsewhere	82,253	13,300	11,399	1,237	93,652	14,537
Total	1,537,682	171,119	37,785,159	4,671,243	39,322,841	4,842,362

Value per pound of oleomargarine exported in 1884.

Exported to—	Imitation butter.	The oil.	Exported to—	Imitation butter.	The oil.
	Cents.	*Cents.*		*Cents.*	*Cents.*
Holland	....	12.44	Canada	10.69	10.17
Belgium	11.51	12.53	Germany	8.46	12.30
United Kingdom	11.36	10.42	Denmark	16.32	10.85

The foregoing figures show that our exports of oleomargarine in 1884 were 18,695,467 pounds in quantity and $1,091,591 in value greater than our exports of butter, and at prices only a little more than one-half the latter.

THE FOREIGN CHEESE MARKET.

Our annual cheese export amounts to over five and one-half times in quantity and three times in value our butter export, the export during the year 1884 amounting to 112,869,575 pounds, valued at $11,663,713.

The imports of cheese into the United Kingdom, which cover the greater portion of the surplus cheese of the several countries, were as follows in 1884:

Imports of cheese into the United Kingdom during the year 1884.

Imported from—	Quantity.	Value.	Value per pound.
	Pounds.		*Cents.*
United States	109,333,280	$12,052,353	11.024
Canada	65,994,544	7,273,301	11.021
Holland	35,777,392	4,342,002	12.137
France	3,036,656	438,600	14.443
Russia	394,800	46,248	11,714
Belgium	362,880	44,717	12.323
Australia	315,056	38,418	12.194
Sweden	278,880	30,340	10.883
Denmark	189,056	21,982	11.627
Germany	93,856	11,255	11.992
Elsewhere	63,168	8,728	15.400
Total	215,839,568	24,307,944	11.262

Considering the immense quantity of American cheese consumed in the United Kingdom—8,000,000 pounds at least of the imports from Canada, above recorded, being American cheese exported by and credited in British returns to the Dominion—it may be held that it stands as well in public estimation as the product from any other country, although the specially prepared cheese of some other countries bring higher prices in the market. These higher figures, however, except in the case of Holland, cover only small quantities, comparatively. It may well be questioned whether the cheese of any other country, in quality and flavor, is superior to American cheese, but the latter still suffers, in price at least, for it does not seem to suffer in consumption from that lingering prejudice which regards all American products as in some mysterious manner inferior to the products of the older countries—a prejudice which has operated very unfavorably for our products, but which is being dissipated by the continuous good qualities of the products them selves.

It will be seen that we supply the British markets with a little more than one-half their total imports of cheese. Our exports of cheese to the United Kingdom during the year 1884, 102,686,547 pounds, and to Canada, 8,803,296 pounds—the greater portion of the latter going to England also—left only 1,879,632 pounds for export to all other countries. It will thus be seen that our foreign cheese trade may be said to be confined to the United Kingdom. Of our immense cheese export during 1884, only a little over 3,000 pounds went to all Europe, outside the United Kingdom.

This branch of our dairy industry calls for no further comment. Our dairy farmers have only to continue to supply the British markets, as heretofore, with good cheese, to maintain the trade at its present magnificient proportions. It may be time to consider, in addition to our manufacture of cheese for general consumption, whether it would not pay to cater to particular and peculiar taste. For instance, French cheese to the amount of over 3,000,000 pounds, valued at over 3 cents per pound more than American cheese, was consumed in the United Kingdom in 1884. Even Dutch cheese, imported to an amount equal to one-third of the total imports of the United States (35,777,392 pounds), is valued at more than 1 cent per pound higher than American cheese by the British customs. Our cheese manufacturers should study the modes of manufacture in the several countries, especially in France, Holland, Switzerland, and Italy, and learn therefrom, if there is anything to be learned, the secrets of special-cheese making. The reports from those countries will be found full and valuable aids to such study.

Our cheese manufacturers should never lose sight of the fact that whenever, without any depreciation in the quality, they can export cheese to the United Kingdom at lower prices than are obtained at present, the result will be an increase in the consumption of this product. Indeed, it would be hard to estimate the increased consumption of American cheese which would result from a decrease of even a penny per pound in the United Kingdom. Of course this principle applies to all other food supplies equally as well as to cheese, and it should always be borne in mind and worked up to by our producers and exporters without waiting for competition to reduce the price.

CANNED AND SALTED BEEF, BEEF TALLOW, ETC.

The foregoing statistics, covering the foreign trade and our present and prospective share therein, in horned cattle, fresh beef, butter, cheese, and oleomargarine, still leave canned and salted beef, beef tallow, and condensed milk before the subject of cattle and cattle products, in this connection, is exhausted.

The details of our trade herein will be found in the tabulated statements immediately following this letter, showing our total exports of cattle and cattle products, by countries and continents, for the year 1884.

Our exports of canned beef for the year 1884 amounted to $3,173,767, of which the United Kingdom took to the value of $2,542,122, while less than $300,000 worth went to the remainder of Europe.

Our exports of beef tallow during the year 1884 amounted to 63,091,103 pounds, valued at $4,793,375. In 1880 our exports of tallow amounted to $110,707,627 pounds, valued at $7,689,262. Of course this showing does not go to prove any decrease in this product during those five years, for it is too apparent that beef tallow in our market must keep pace with the slaughter of cattle, and the latter having increased very largely during the years under review, it follows that the falling off in our export of the former is wholly due to an increased home consumption. This increased consumption is in the line of oleomargarine manufacture, and our exports of the latter, together with our home consumption thereof, will fully cover any decrease in the export of beef tallow.

Of the total tallow export of 1884, 57,706,979 pounds, valued at $4,339,322, went to Europe, of which much more than one-half went to the United Kingdom, France (8,514,000 pounds), Belgium, and Holland following in their respective order.

Our total exports of salted beef in 1884 amounted to 42,379,911 pounds, valued at $3,202,275, of which 31,410,557 pounds, valued at $2,410,557, went to Europe; 9,652,769 pounds, valued at $708,934, to countries in America; and 313,200 and 227,390 pounds to Asia and Africa, respectively. The United Kingdom took the principal portion of this product, as of all the other cattle products reviewed, oleomargarine excepted, no less than 26,831,030 pounds, valued at $2,058,383, going thither.

Our total exports of cattle and cattle products during the year 1884 were as follows:

Designation.	Quantity.	Value.	Designation.	Quantity.	Value.
Cattle............ number.	190, 518	$17, 855, 495	Cheese .... pounds.	112, 869, 575	$11, 663, 713
Fresh beef .... pounds.	120, 784, 064	11, 987, 331	Beef tallow .... do..	63, 091, 103	4, 793, 375
Canned beef	....	3, 178, 767	Oleomargarine ...... do..	39, 322, 894	4, 842, 362
Salted beef....... pounds.	42, 379, 911	3, 202, 275	Condensed milk	....	203, 008
Other beef .... do..	641, 163	67, 758			
Butter .... do..	20, 627, 374	3, 750, 771	Total...............	....	61, 544, 855

CATTLE-BREEDING IN FOREIGN COUNTRIES.

As remarked at the beginning of this letter, those portions of the consular reports which deal with the many-sided, and, it may be added, finely-shaded subject of cattle-breeding in the various countries, the cattle most suitable for export to the United States, the best modes and routes of imports hither, the various phases of dairy farming, &c., do not adapt themselves to statistical analyses in any more condensed forms than those given in the various reports themselves; hence, these portions of the general subject are left untouched.

As was to be expected from the nature of the interests involved and the conditions by which they are surrounded, many of the consular reports treat of the same breeds of cattle, and many seem to have the appearance of repetition. Care has been taken, however, to guard against such repetition, while, at the same time, giving due consideration to the efforts and labors of the consuls. Regard for consular efforts is, however, herein conserved by regard for the general interests involved, for the various reports, treating of the same breeds of cattle and their relative merits, give a many-sided view of the same subject, and hence serve to modify and correct each other; for the admirers of special breeds, without intending to be partial, are sure to paint their favorites in colors too glowing. Hence the wisdom, as well as utility, of giving the reports in full, leaving the intelligent cattle-breeders of the United States to draw their own conclusions therefrom.

One of the most interesting parts of the whole subject of cattle-breeding is that relating to cross-breeding and its results in the several countries. In this connection, as well as in helping to show the modifications and shadings which change of countries, or districts within countries, has effected on what are called pure-bred cattle and on the cattle bred from intermixture of the native breeds therewith, the illustrations which accompany the reports will greatly aid the stock-breeders of the United States in arriving at correct conclusions and immediate results—results which, it should be remembered, have been attained in the Old World only by slow, patient, and costly effort; indeed, the whole experience of Europe is herein laid open to our cattlemen and dairy farmers.

As there is no portion of this vast subject which has produced more heated discussion and honest difference of opinion among those directly concerned than the wisdom or otherwise of getting what some of our consuls call "fancy-stock crazed," and paying more for a single "blooded" animal than a well-stocked moderate farm is usually worth, and as many of these reports, principally those which treat of the fine and noted breeds in the United Kingdom, are undoubtedly calculated to incite the enthusiasm of American cattlemen, a paper from Consul Tanner, of Liége, Belgium, which is, in part, an argument, supported by valuable statistics, against such enthusiasm, and intended to prove that our farmers can, by selection and care, develop a race of American cattle equal to any so-called "blooded stock," has been inserted as a prelude to the general reports. Such facts as that our cattle are now the best foreign cattle slaughtered for the British market, and the evidence given before the Ontario agricultural commission by a leading cattle exporter, that the Western cattle of the United States "are far superior to Canadian grain-fed cattle, there being no comparison between them," should be remembered in this connection.

Without desiring to advocate or combat the views herein set forth, feeling well assured that the cattle-breeders of the United States are fully competent to read and digest the matter contained in these reports, I cannot help feeling that many of the latter are calculated to arouse a certain amount of enthusiasm where only the coolest calculation is called for. In this regard Consul Tanner's paper on "Cattle-breeding in Europe and in the United States," with its mass of valuable European opinion, methods of feeding, breeding for show and for sale, principally to American cattlemen, will at least serve to moderate those reports written, or incited, by breeders of "blooded stock," who, naturally enough, write lovingly of their favorites.

Given that full consideration and calm deliberation which American cattle-breeders and dairy farmers are surely capable of giving to such a congenial subject as cattle-breeding and dairy-farming, these reports, together with the statistics attached thereto in a supplementary form, contain, it is confidently believed, a mass of information such as has never before been compiled and published in any country, and must prove of great value to the cattlemen and dairy farmers of the United States.

I have the honor to be, sir, your obedient servant,

T. F. BAYARD.

Hon. JOHN G. CARLISLE,
Speaker of the House of Representatives.

Tabulated statements accompanying the Secretary's letter.

Cattle statistics:

(1) Statement showing the exports of cattle from the United States during the eleven years ending with the year 1884, showing the numbers and total value and the value per head of the cattle exported to each country.

(2) Statement showing the imports of cattle into the United Kingdom during the eleven years ending with the year 1884, showing the number and total value and the value per head of the cattle imported from each country.

Fresh beef statistics:

(3) Statement showing the exports of fresh beef from the United States from the year 1877 (the first officially recorded year of its export) to and including the year 1884, showing the quantity and total value and the value per pound of the exports to each country.

(4) Statement showing the imports of fresh beef into the United Kingdom during the eleven years ending with the year 1884, showing the quantity and total value and the value per pound of the imports from each country.

Butter statistics:

(5) Statement showing the exports of butter from the United States during the eleven years ending with the year 1884, showing the quantity and value of the exports to each continent and country therein.

(6) Statement showing the imports of butter and oleomargarine into the United Kingdom during the eleven years ending with the year 1884, showing the quantity and total value and value per pound of the imports from each country.

Cheese statistics:

(7) Statement showing the exports of cheese from the United States during the eleven years ending with the year 1884, showing the quantity and value of the exports to each continent and country therein.

(8) Statement showing the imports of cheese into the United Kingdom during the eleven years ending with the year 1884, showing the quantity and total value and the value per pound of the imports from each country.

General statistics:

(9) Statement showing the exports from the United States of cattle and cattle products—horned cattle, fresh beef, canned beef, salted beef, other beef, butter, cheese, beef tallow, and oleomargarine—during the year 1884, showing the number, quantity, and value of the several products exported to each country.

I.—*Statement showing the exports of cattle from the United States during the eleven years ending with the year* 1884.

a.—*Number of cattle exported in each year.*

Exported to—	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
United Kingdom	*123	110	244	5,091	24,982	71,794	125,742	134,361	68,008	76,091	169,257
Canada	6,357	5,318	8,829	12,637	9,837	8,555	2,840	4,657	2,801	3,825	3,475
British West Indies	1,306	1,828	1,580	1,741	1,574	1,531	2,409	1,978	1,529	1,174	1,135
Mexico	11,515	12,018	6,345	2,809	964	2,145	992	1,254	792	1,842	8,093
Cuba	36,461	37,696	34,496	27,388	40,172	49,228	45,517	38,941	34,603	20,784	8,015
Germany	....	....	....	....	1,171	1,330	....	207	6	....	323
France	....	....	....	....	389	118	1,240	1,297	110	....	....
Elsewhere	305	241	98	335	951	2,019	4,016	3,012	261	728	220
Total	56,067	57,211	51,592	50,001	80,040	136,720	182,756	185,707	108,110	104,444	190,518

b.—*Total value of cattle exported in each year.*

Exported to—	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
United Kingdom	*$113,800	$73,000	$31,220	$546,829	$2,408,843	$6,616,114	$11,847,742	$12,995,283	$6,960,600	$7,602,244	$17,336,606
Canada	164,951	156,685	304,804	389,235	452,547	518,195	92,943	136,562	124,144	146,945	96,820
British West Indies	107,466	151,942	142,268	147,632	119,734	104,224	152,279	133,494	115,459	95,714	98,968
Mexico	95,514	111,930	56,733	27,952	8,196	20,325	10,632	13,724	18,602	47,492	128,630
Cuba	636,654	585,980	564,188	439,967	683,963	777,326	703,954	597,936	548,301	366,602	145,024
Germany	....	....	....	....	87,648	116,860	....	16,800	700	....	30,200
France	....	....	....	....	35,700	11,800	135,370	129,520	10,000	....	....
Elsewhere	32,472	23,548	11,579	41,459	100,187	214,356	401,275	280,766	22,421	82,431	19,247
Total	1,150,857	1,103,085	1,110,792	1,593,080	3,896,818	8,379,200	13,344,195	14,304,103	7,800,227	8,341,431	17,855,495

c.—*Value per head of cattle exported to each country.*

Exported to—	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
United Kingdom	*$925 20	$663 64	$299 18	$107 41	$96 02	$92 15	$94 22	$96 72	$102 35	$99 91	$102 43
Canada	25 92	29 37	31 52	30 82	46 05	60 57	32 73	29 32	44 32	38 42	27 57
British West Indies	82 29	83 12	90 04	84 74	75 43	68 08	63 21	67 49	75 51	81 53	87 19
Mexico	8 29	9 31	8 94	9 95	8 50	9 52	10 72	10 96	23 49	25 71	15 89
Cuba	17 47	15 54	16 36	16 06	17 02	19 32	15 46	15 36	15 85	17 64	18 22
Germany	....	....	....	....	74 85	87 86	....	81 16	116 66	....	92 08
France	....	....	....	....	91 80	100 00	109 17	99 86	90 91	....	....

---

* The exports of cattle to the United Kingdom in 1874 are entered as follows in the official returns: To England, 18 head, valued at $5,850 per head, $105,300; to Scotland, 105 head, valued at $80.95 per head, $8,500. The 18 head of cattle exported to England were evidently some very fancy stock, exported for breeding purposes.

II.—*Statement showing the importations of cattle (oxen and bulls) into the United Kingdom during the eleven years ending with the year* 1884.

a.—*Number of cattle imported in each year.*

Whence imported.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
Sweden	7, 100	3, 673	5, 004	4, 077	6, 504	6, 730	7, 644	9, 816	15, 103	17, 989	12, 426
Norway	1, 019	227	77	104	62	736	788	649	563	870	865
Denmark	17, 463	29, 432	36, 528	31, 620	29, 382	21, 828	34, 477	34, 534	49, 929	60, 834	42, 747
Germany	41, 907	50, 041	51, 616	33, 704	28, 822	23, 367	25, 335	23, 847	29, 887	28, 182	17, 310
Holland	19, 889	27, 196	26, 708	15, 085	8, 672	1, 637	5, 081	4, 650	18, 877	3, 995	2, 561
Belgium	1, 180	7, 139	6, 721	372	....	....	....	....	....	....	....
France	2, 264	8, 985	4, 559	2, 838	356	290	1, 445	2, 499	15, 860	3, 287	....
Portugal	12, 483	21, 432	13, 924	14, 582	14, 047	14, 266	16, 258	13, 385	22, 993	21, 866	17, 903
Spain	16, 580	23, 853	20, 786	27, 278	22, 398	17, 004	23, 187	16, 629	31, 139	23, 485	17, 482
United States	....	299	380	11, 523	68, 903	75, 931	156, 490	102, 020	47, 664	154, 982	139, 213
Canada	273	1, 212	2, 655	7, 359	17, 955	25, 079	47, 215	43, 359	32, 114	53, 034	59, 054
All other	....	....	....	76	....	....	88	264	187	86	136
Total	120, 108	174, 236	168, 958	148, 618	197, 101	186, 868	317, 408	251, 652	264, 316	367, 662	309, 696
b.—*Value of cattle imported during each year.*											
Sweden	$683, 748	$381, 024	$526, 095	$437, 633	$771, 170	$757, 131	$684, 390	$955, 155	$1, 452, 945	$1, 738, 650	$1, 205, 280
Norway	87, 956	20, 981	5, 950	9, 419	60, 264	64, 706	76, 594	60, 750	51, 239	82, 703	84, 078
Denmark	1, 627, 235	2, 736, 389	3, 337, 804	2, 871, 249	2, 657, 438	1, 998, 383	3, 260, 060	3, 333, 960	4, 855, 140	5, 929, 200	4, 160, 160
Germany	4, 109, 130	5, 201, 098	5, 457, 986	4, 058, 642	3, 513, 215	2, 448, 468	2, 603, 562	2, 329, 378	3, 203, 142	2, 923, 776	1, 681, 560
Holland	1, 972, 188	2, 752, 704	2, 641, 410	1, 493, 964	845, 640	154, 834	496, 776	450, 522	1, 831, 248	385, 398	247, 860
Belgium	124, 902	901, 520	821, 826	43, 254	....	....	....	....	....	....	....
France	255, 648	1, 229, 918	649, 296	415, 932	43, 554	35, 964	171, 944	301, 806	1, 919, 018	412, 128	....
Portugal	1, 285, 638	2, 559, 416	1, 572, 210	1, 649, 198	1, 622, 754	1, 612, 548	1, 855, 548	1, 385, 100	2, 306, 958	2, 232, 536	1, 866, 240
Spain	1, 507, 086	2, 138, 440	1, 828, 818	2, 373, 674	2, 049, 948	1, 470, 636	2, 044, 116	1, 507, 086	2, 843, 586	2, 158, 680	1, 589, 220
United States	....	43, 740	52, 002	1, 468, 792	8, 118, 730	8, 661, 492	17, 886, 174	11, 665, 944	5, 350, 290	17, 191, 764	16, 120, 600
Canada	26, 730	210, 924	345, 496	928, 598	1, 972, 304	2, 654, 532	4, 913, 818	4, 494, 666	3, 445, 862	5, 451, 298	6, 123, 600
All other	....	....	....	10, 625	....	....	12, 428	25, 105	28, 072	25, 143	21, 748
Total	11,680, 261	18, 176, 154	17, 238, 893	15, 760, 980	17, 274, 772	19, 858, 694	34, 005, 420	26, 609, 472	27, 290, 500	38, 531, 276	33, 100, 346

c.—Value per head of the cattle imported in each year.

Sweden	$96 31	$103 73	$105 13	$109 22	$118 55	$112 49	$97 16	$96 90	$96 22	$96 66	$97 32
Norway	86 32	92 43	77 27	90 57	97 20	87 92	97 20	93 60	91 01	95 06	97 08
Denmark	91 67	91 86	91 92	90 80	90 45	91 10	94 30	96 54	97 24	97 47	97 00
Germany	98 06	103 73	105 89	120 66	120 02	104 78	102 96	98 10	107 18	103 74	97 14
Holland	99 16	100 48	98 90	99 04	97 51	94 50	97 77	96 89	97 06	98 69	96 74
France	111 60	136 89	142 42	144 92	122 31	124 02	117 37	120 62	120 96	125 38	....
Portugal	102 98	118 31	112 91	113 10	115 52	113 04	114 13	103 48	100 46	103 93	104 24
Spain	90 90	89 67	87 98	87 00	91 52	86 48	88 15	90 63	91 32	91 92	90 91
United States	....	146 29	136 32	127 46	118 68	113 53	114 32	114 35	113 79	111 07	115 79
Canada	97 90	174 03	130 13	126 78	104 28	105 85	104 07	105 85	107 23	104 66	103 69
Total average*	97 20	104 32	101 99	106 05	112 97	106 12	107 17	105 74	103 28	104 81	106 88

---

* In 1878 the imports of American cattle began to be felt in the British markets; after that year they dominate the general prices.

III.—*Statement showing the exports of fresh beef from the United States from the year 1877, the first year of any recorded export thereof, to the year 1884, both years inclusive.*

a.—Quantity exported in each year.

Exported to—	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
United Kingdom	49, 210, 990	53, 546, 469	52, 792, 969	84, 454, 881	103, 352, 477	65, 372, 941	79, 070, 842	115, 601, 057
France		487, 690	1, 039, 941					
Canada			187, 502	191, 322	2, 598, 507	4, 180, 253	1, 702, 982	5, 029, 161
Elsewhere		12, 552	5, 420	70, 931	59, 828	33, 272	290, 549	153, 846
Total	49, 210, 990	54, 046, 711	54, 025, 832	84, 717, 134	106, 004, 812	69, 586, 466	81, 064, 373	120, 784, 064

b.—Value of the exports for each year.

United Kingdom	$4, 552, 523	$5, 026, 122	$4, 776, 572	$7, 425, 255	$9, 652, 568	$6, 329, 449	$8, 160, 769	$11, 516, 369
France		42, 537	96, 934					
Canada			9, 022	10, 285	201, 037	435, 435	144, 982	455, 003
Elsewhere		1, 167	542	6, 378	6, 679	3, 997	36, 380	15, 955
Total	4, 552, 523	5, 009, 856	4, 883, 080	7, 441, 918	9, 860, 284	6, 768, 881	8, 342, 131	11, 987, 331

c.—Value per pound for each year.

	Cents.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
United Kingdom	9. 25	9. 39	9. 05	8. 81	9. 34	9. 68	10. 32	9. 96
France		8. 72	9. 32					
Canada			4. 80	5. 37	7. 75	10. 41	8. 51	9. 05
Elsewhere		9. 30	10. 00	8. 99	11. 16	12. 01	12. 52	10. 37
Total	9. 25	9. 29	9. 04	8. 77	9. 30	9. 73	10. 29	9. 92

IV.—*Statement showing the imports of fresh beef into the United Kingdom during the eleven years ending with the year* 1884.

a.—Total quantity imported in each year.

Imported from—	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
United States	122, 680	346, 896	16, 164, 512	49, 620, 704	54, 127, 344	62, 689, 760	81, 118, 464	83, 751, 920	50, 039, 136	81, 868, 192	90, 904, 128
Canada		25, 424	71, 336	2, 232, 160	2, 062, 486	953, 792	182, 000	6, 753, 440	2, 576	3, 802, 512	2, 643, 872
Russia										2, 462, 432	3, 551, 184
Germany	3, 650, 784	3, 107, 112	2, 414, 608	252, 896	620, 592	46, 704	15, 120	509, 488	1, 454, 344	1, 615, 152	711, 648
Australasia										170, 464	308, 448
France				361, 998						29, 456	104, 272
Elsewhere			143, 560	47, 586	175, 962		152, 220	522, 592	466, 792	188, 720	151, 648
Total			18, 794, 016	52, 515 344	56, 986, 384	63, 690, 256	81, 467, 804	91, 537, 040	51, 962, 848	94, 136, 928	98, 375, 200

b.—Total value of the imports for each year.

United States	$12, 714	$40,811	$1, 893, 456	$5, 851, 440	$6, 215, 940	$7, 260, 840	$9, 143, 090	$9, 611, 360	$6, 038, 064	$10, 006, 740	$10, 724, 579
Canada		4, 105	8, 991	251, 859	227, 788	107, 552	20, 076	844, 902	291	457, 909	320, 531
Russia										264, 792	352, 107
Germany	376, 516	356, 578	265, 356	30, 424	78, 246	5, 929	2, 012	58, 893	170, 464	208, 503	89, 409
Australasia										20, 563	32, 843
France				64, 395						4, 748	17, 593
Elsewhere			17, 227	3, 927	20, 777		18, 910	59, 602	66, 243	24, 918	16, 418
Total			2, 185, 030	6, 202, 445	6, 542, 751	7, 374, 321	9, 184, 088	10, 574, 757	6, 275, 062	10, 998, 173	11, 553, 480

c.—Price per pound in each year.

	Cents.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
United States	10. 36	11. 76	11. 49	11. 77	11. 11	11. 58	11. 27	11. 48	12. 06	12. 22	11. 80
Canada		16. 14	12. 60	11. 26	11. 04	11. 27	11. 03	12. 51	11. 30	12. 44	12. 12
Russia										10. 84	9. 12
Germany	10. 31	11. 45	10. 99	12. 04	12. 50	12. 63	13. 31	11. 56	11. 71	12. 91	12. 56
Australasia										12. 46	10. 64
France				17. 79						16. 12	16. 88
Elsewhere			12. 00	8. 25	11. 81		12. 42	11. 40	14. 19	13. 19	10. 56
Total			11. 63	11. 81	11. 46	11. 53	11. 27	11. 55	12. 08	12. 19	11. 74

V.—*Exportation of butter from the United States for eleven years, 1874–1884.*

Whither exported.	1874.		1875.		1879.		1883.		1884.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
To Europe:	*Pounds.*		*Pounds.*		*Pounds.*		*Pounds.*		*Pounds.*	
Belgium	16, 183	$4, 208	73, 850	$14, 715	38, 147	$7, 444	1, 420	$200	17, 626	$2, 973
France	5, 040	2, 441	....	....	61, 815	9, 749	118, 596	25, 250	64, 409	13, 794
Germany	148, 889	27, 434	162, 283	36, 868	8, 210, 578	884, 735	870, 043	132, 827	2, 840, 757	418, 329
The United Kingdom	1, 378, 890	304, 191	3, 265, 360	719, 169	24, 851, 723	3, 727, 971	4, 817, 362	904, 965	9, 591, 337	1, 876, 341
Gibraltar	....	....	470	142	11, 678	1, 917	....	....	709	211
Holland	....	....	411	60	48, 507	6, 388	....	....	11, 840	1, 342
Portugal	....	....	2, 650	790	....	....	....	....	142	28
Spain	9, 261	1, 639	210	42	939	199	100	17	....	....
Sweden and Norway	....	....	....	....	....	....	....	....	370, 371	55, 680
Denmark	....	....	....	....	....	....	....	....	421, 377	60, 605
Total to Europe	1, 558, 263	339, 913	3, 504, 964	771, 786	33, 203, 387	4, 638, 403	5, 807, 461	1, 063, 259	13, 318, 568	2, 428, 703
To America:										
Argentine Republic	....	....	500	100	200	30	....	....	2, 040	400
Brazil	21, 670	5, 303	13, 573	2, 767	174, 011	38, 815	198, 770	38, 902	299, 253	56, 960
Central America	17, 100	5, 191	16, 606	5, 202	26, 646	4, 322	37, 301	9, 313	59, 434	13, 046
Chili	285	125	....	....	1, 500	240	700	152	6, 354	1, 339
Danish West Indies	107, 171	26, 450	98, 921	22, 115	169, 740	24, 094	152, 938	25, 877	161, 744	25, 110
French possessions	56, 289	11, 248	49, 793	10, 647	200, 872	19, 134	332, 907	54, 036	623, 316	87, 492
Canada	426, 310	94, 306	357, 623	94, 813	824, 371	102, 064	1, 242, 651	197, 365	1, 825, 496	346, 199
British West Indies	636, 383	160, 630	680, 201	167, 215	1, 346, 279	184, 731	1, 927, 893	343, 417	1, 800, 034	308, 147
British Guiana	16, 493	5, 126	5, 895	2, 274	75, 242	10, 319	115, 650	19, 872	122, 275	20, 115
British Honduras	....	....	....	....	....	....	64, 897	14, 019	68, 407	13, 689
Mexico	62, 569	19, 191	57, 148	16, 285	69, 617	15, 891	124, 913	30, 470	102, 460	23, 435
Dutch possessions	101, 231	26, 794	127, 549	31, 025	162, 572	25, 741	173, 620	34, 273	172, 165	30, 881
Peru	19, 557	7, 527	2, 328	869	10, 947	2, 585	50	23	13, 156	2, 591
San Domingo	98, 604	27, 997	69, 980	19, 369	99, 607	17, 354	112, 068	24, 616	132, 252	23, 654
Hayti	269, 371	75, 794	269, 601	71, 385	323, 677	49, 998	411, 168	79, 963	348, 816	63, 654
Spanish West Indies	436, 346	115, 216	595, 476	145, 485	638, 628	83, 996	396, 288	86, 922	441, 288	75, 457
United States of Colombia	297, 796	92, 887	185, 501	57, 952	269, 686	53, 114	343, 898	72, 804	377, 485	71, 497
Venezuela	99, 286	29, 128	85, 138	25, 162	209, 152	38, 599	385, 675	80, 896	368, 057	70, 858
Total to America	2, 666, 461	703, 213	2, 615, 833	672, 665	4, 602, 327	671, 327	6, 021, 940	1, 112, 940	6, 924, 034	1, 234, 524
To Asia:										
China	17, 209	5, 709	4, 960	1, 868	25, 517	6, 782	12, 064	3, 480	15, 089	3, 514
Hong-Kong	1, 140	369	....	....	9, 258	2, 512	27, 524	6, 508	8, 109	1, 809

Japan	67, 932	24, 118	53, 865	19, 735	105, 937	24, 344	90, 078	22, 406	90, 243	19, 124
Russia in Asia	20, 701	7, 664	75, 867	18, 863	8, 550	2, 069	6, 263	1, 394	4, 586	1, 158
Total to Asia	107, 002	37, 860	134, 692	40, 466	149, 262	35, 707	135, 929	33, 788	118, 027	25, 605
To Africa:										
British Africa	11, 838	3, 481	23, 196	7, 865	75, 419	18, 805	9, 588	2, 393	54, 026	9, 849
Liberia	4, 809	1, 752	4, 828	1, 497	1, 362	444	1, 341	380	2, 194	612
Spanish Africa	250	58	726	207	309	87	1, 140	245	100	18
Total to Africa	16, 897	5, 291	28, 750	9, 569	77, 080	19, 336	12, 069	3, 018	56, 320	10, 479
Not designated	19, 359	6, 104	76, 588	12, 510	323, 446	56, 492	391, 795	77, 660	210, 425	51, 460
Grand total	4, 367, 982	1, 092, 381	6, 360, 827	1, 506, 996	38, 246, 616	5, 421, 265	12, 348, 641	2, 290, 665	20, 627, 374	3, 750, 771

VI.—*Statement showing the imports of butter into the United Kingdom during the eleven years ending with the year 1884, oleomargarine included.*

a.—*Total quantities imported during each year.*

Imported from—	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Sweden	2, 608, 684	3, 128, 014	3, 294, 144	4, 317, 040	4, 383, 456	5, 720, 502	7, 989, 520	7, 414, 736	7, 595, 952	10, 859, 980	11, 404, 064
Norway	63, 280	42, 448	65, 408	13, 888	1, 215, 536	1, 991, 248	3, 502, 576	2, 891, 168	1, 219, 360	2, 424, 912	3, 489, 472
Denmark	25, 317, 936	23, 091, 152	22, 981, 840	23, 536, 064	27, 151, 824	31, 554, 880	33, 617, 912	31, 358, 000	34, 128, 967	39, 601, 408	37, 527, 504
Germany	15, 123, 024	12, 194, 336	12, 539, 734	10, 915, 952	12, 328, 736	12, 889, 600	13, 089, 904	12, 193, 662	12, 685, 344	15, 066, 800	16, 177, 280
Holland	39. 379, 760	39, 995, 872	45, 134 208	41, 679, 085	51, 587, 312	73, 408, 224	90, 777, 008	83, 479, 872	103, 172, 384	110, 748, 032	124, 924, 128
Belgium	8, 592, 976	8, 954, 400	7, 314, 668	6, 518, 400	8, 968, 176	7, 059, 584	5, 965, 008	5, 613, 216	6, 143, 148	5, 671, 456	6, 740, 272
France	79, 884, 112	63, 566, 720	69, 718, 656	67, 957, 344	62, 190, 464	49, 137, 200	59, 549, 728	55, 633, 088	64, 461, 660	56, 368, 480	37, 121, 108
United States	4, 066, 384	4, 517, 072	13, 230, 672	21, 110, 992	24, 616, 806	33, 718, 018	31, 112, 480	19, 515, 552	5, 739, 552	13, 458, 236	11, 231, 472
Canada	5, 629, 120	8, 286, 432	11, 040, 844	6, 302, 048	7, 506, 912	12, 480, 496	12, 331, 000	8, 758, 504	4, 913, 888	6, 063, 344	6, 208, 944
New South Wales	96, 432	6, 160	....	39, 200	21, 056	14, 448	514, 968	1, 546, 352	608, 824	....	508, 480
Elsewhere	656, 788	618, 834	542, 980	999, 113	1, 239, 626	1, 110, 455	2, 096, 464	898, 042	2, 357, 665	1, 198, 328	1, 916, 208
Total	181, 418, 496	164, 401, 440	185, 863, 104	183, 389, 136	201, 209, 904	229, 084, 688	260, 546, 160	229, 302, 192	243, 019, 704	261, 460, 976	277, 248, 832
b.—*Total value of imports during each year.*											
Sweden	$671, 166	$776, 142	$898, 614	$1, 159, 596	$1, 143, 558	$1, 419, 606	$2, 000, 376	$1, 870, 128	$1, 910, 952	$2, 698, 758	$2, 887, 384
Norway	16, 496	11, 178	17, 010	3, 898	158, 436	355, 266	601, 416	586, 602	226, 962	439, 213	610, 564
Denmark	6, 624, 904	6, 200, 874	6, 375, 378	6, 550, 306	7, 382, 052	8, 133, 210	8, 637, 192	8, 222, 634	8, 993, 916	10, 457, 262	9, 761, 052
Germany	3, 725, 592	3, 129, 354	3, 292, 650	2, 878, 204	3, 170, 178	2, 869, 810	3, 029, 586	2, 933, 496	3, 106, 998	3, 928, 824	4, 180, 251
Holland	9, 126, 108	9, 320, 994	10, 944, 094	10, 131, 642	12, 125, 214	16, 139, 146	19, 811, 304	18, 205, 074	20, 950, 488	20, 431, 926	24, 285, 575
Belgium	2, 263, 330	2, 415, 140	2, 037, 312	1, 837, 510	2, 429, 514	1, 991, 232	1, 472, 580	1, 385, 016	1, 466, 262	1, 274, 292	1, 348, 848
France	19, 168, 812	16, 461, 792	18, 139, 464	17, 760, 870	15, 451, 398	11, 009, 077	13, 727, 276	13, 223, 574	15, 754, 176	13, 762, 548	14, 077, 539
United States	917, 417	1, 000, 674	2, 838, 466	4, 474, 116	4, 854, 168	6, 041, 466	6, 528, 924	4, 107, 186	1, 218, 881	2, 732, 778	2, 179, 982
Canada	1, 308, 798	1, 832, 912	2, 504, 358	1, 374, 408	1, 423, 008	2, 330, 856	2, 673, 972	1, 871, 100	1, 041, 498	1, 244, 063	1, 243, 028
New South Wales	17, 010	1, 020	....	5, 953	3, 178	1, 458	63, 666	249, 170	134, 753	....	93, 924
Elsewhere	143, 438	205, 720	183, 237	204, 090	235, 993	193, 008	402, 133	145, 514	360, 532	251, 650	293, 044
Total	43, 983, 121	41, 320, 728	47, 230, 583	46, 380, 593	48, 376, 697	50, 444, 132	59, 005, 425	52, 809, 494	55, 165, 418	57, 221, 314	60, 961, 191
c.—*Value per pound of the imports for each year.*											
	Cents.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
Sweden	22. 73	24. 81	27. 28	26. 86	26. 09	24. 81	25. 04	25. 22	25. 16	24. 85	25. 32
Norway	26. 05	26. 33	26. 01	28. 07	13. 03	18. 21	17. 35	20. 29	18. 60	18. 11	17. 51

UNIVERSITY OF CALIFORNIA

VI.—*Statement showing the imports of butter into the United Kingdom, &c.*—Continued.

c.—*Value per pound of the imports for each year*—Continued.

Imported from—	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
	Cents.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
Denmark	24.59	26.85	27.75	27.80	27.19	25.80	25.66	26.25	26.35	26.41	26.01
Germany	24.57	25.65	26.25	26.36	25.71	22.34	23.40	24.55	24.49	26.08	25.84
Holland	23.15	22.30	24.26	24.31	23.50	20.05	21.82	21.81	20.30	20.40	19.44
Belgium	26.35	26.97	27.80	28.19	27.09	26.93	24.72	24.71	23.87	22.47	20.00
France	23.93	25.89	26.02	26.16	24.85	22.43	23.05	23.76	24.44	23.76	24.64
United States	22.56	24.87	21.38	21.19	19.72	17.92	20.98	21.04	21.22	20.30	19.41
Canada	23.25	22.12	22.68	22.78	18.95	18.68	21.70	20.22	21.19	20.51	20.02
Australasia	18.08	16.56	....	15.69	15.14	10.09	12.36	16.11	22.13	....	18.47
Total	24.24	25.13	25.42	25.29	24.04	22.02	22.65	23.03	22.69	21.89	21.99

VII.—*Statement showing the exports of cheese from the United States for eleven years.*

Exported to—	1874.		1875.		1879.		1883.		1884.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Pounds.		*Pounds.*		*Pounds.*		*Pounds.*		*Pounds.*	
The continent of Europe:										
Belgium	2,500	$264	113,964	$14,911	19,163	$1,643				
France	18,019	2,550			27,273	2,460	9,481	$1,597	3,888	$420
Germany	10,382,028	1,437,810	8,526,648	1,084,086	410,827	33,740	185,713	17,117	79,661	2,806
The United Kingdom	78,552,976	10,213,178	89,817,648	12,199,030	136,600,368	12,122,099	91,582,055	10,210,454	102,686,547	10,508,526
Gibraltar	900	100			1,721	157				
Holland			60,000	9,000	310	31	1,025	76	113	15
Russia	6,015	1,008								
Spain	39,496	6,427	4,059	665	260	25	188	29		
Total to Europe	89,001,934	11,661,237	98,522,319	13,307,692	137,059,922	12,160,155	91,778,462	10,229,273	102,770,209	10,511,767
The continent of America:										
Brazil	3,434	547	1,284	180	5,102	663	1,202	148	570	96
Central American States	14,625	2,317	20,415	3,454	21,932	2,190	26,046	3,882	30,940	4,300
Danish West Indies	25,353	3,138	23,667	3,043	50,582	4,630	31,055	4,093	42,360	4,333
French possessions	2,313	502	470	81	39,777	3,275	13,012	1,857	3,992	491
Canada	335,234	41,734	1,309,235	168,260	2,876,405	231,666	5,786,103	662,719	8,303,396	895,290
British West Indies	509,318	77,724	373,675	55,137	591,069	58,776	545,975	74,555	621,108	84,316
British Guiana	149,290	20,868	132,673	19,666	211,778	21,483	198,939	26,423	185,154	24,702
British Honduras							52,053	4,474	32,058	4,336
Hayti	108,600	18,808	68,515	13,001	91,502	12,125	65,370	10,646	43,591	6,615
Mexico	27,499	4,810	23,462	4,381	68,738	8,335	67,308	11,193	59,267	9,965
Dutch possessions	22,998	4,098	6,819	964	5,540	689	7,183	1,118	7,149	1,042
Peru	620	60	150	49						
San Domingo	36,631	6,464	38,817	7,382	31,636	4,425	57,239	9,455	58,447	9,387
Spanish West Indies	250,309	36,069	289,323	43,198	347,091	39,689	288,008	46,487	295,260	45,608
United States of Colombia	28,730	4,818	36,437	5,754	34,876	4,462	121,950	17,291	210,013	30,791
Venezuela	24,168	3,689	10,902	1,854	6,728	817	15,242	2,530	13,021	2,254
Total to America	1,539,124	225,646	2,335 844	326,504	4,382,766	393,225	7,276,685	876,871	9,905,886	1,123,536
The continent of Asia:										
China	28,567	5,012	21,632	3.830	32,877	4,616	21,928	3,498	24,027	3,686
Hong-Kong	11,498	360	14,360	2,588	28,977	3,897	27,162	3,855	34,459	5,168
Japan	29,723	4,979	41,853	7,815	34,914	4,694	32,918	5,301	22,322	3,630
Russia in Asia	2,802	426	3,110	462			242	55	1,276	233
Total to Asia	72,590	10,777	80,955	14 690	96,768	13,207	82,250	12,709	82,084	12,717

The continent of Africa:										
British Africa	....	....	....	....	25, 161	2, 457	1, 889	322	208	38
Liberia	....	....	1, 044	229	1, 201	179	1, 317	214	1, 311	242
Spanish Africa	1, 431	234	27	5	1, 077	188	612	90	....	....
Total to Africa	1, 431	234	1, 071	234	27, 539	2, 824	3, 818	626	1, 519	280
Not designated	6, 000	1, 091	70, 663	10, 567	87, 479	10, 557	79, 852	15, 447	109, 863	15, 403
Grand total	90, 621, 079	11, 898, 995	101, 010, 852	13, 645, 692	141, 654, 474	12, 579, 968	99, 220, 467	11, 134, 926	112, 869, 575	11, 663 713

VIII.—*Statement showing the imports of cheese into the United Kingdom during the eleven years ending with 1884.*

a.—*Total quantity imported in each year.*

Imported from—	1874.	1875.*	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Holland	44, 664, 356	41, 454, 776	37, 008, 720	38, 302, 320	39, 770, 800	30, 804, 368	32, 230, 082	29, 637, 912	31, 802, 320	32, 786, 680	35, 377, 392
France	....	....	....	1, 076, 768	....	....	1, 761, 536	2, 056, 544	2, 241, 680	2, 497, 164	3, 036, 656
United States	95, 192, 496	107, 405, 536	104, 854, 736	121, 278, 528	150, 723, 440	136, 074, 908	131, 207, 776	139, 374, 928	108, 858, 224	110, 991, 856	109, 333, 280
Canada	24, 776, 816	31, 314, 384	28, 008, 064	23, 992, 580	28, 250, 432	31, 098, 256	31, 535, 170	33, 540, 528	42, 823, 424	54, 004, 496	65, 994, 544
Elsewhere	1, 716, 012	2, 133, 150	1, 723, 325	588, 844	1, 767, 536	2, 471, 220	2, 177, 100	1, 480, 168	1, 072, 128	1, 286, 652	2, 097, 696
Total	166, 349, 680	182, 307, 796	171, 594, 848	185, 239, 040	220, 512, 208	200, 448, 752	198, 911, 664	206, 090, 080	189, 797, 776	201, 566, 848	215, 839, 568

b.—*Total value of the imports for each year.*

Imported from—	1874.	1875.*	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
Holland	$5, 661, 364	$5, 241, 996	$4, 585, 084	$4, 786, 614	$4, 950, 882	$3, 611, 466	$3, 939, 516	$3, 630, 420	$4, 208, 760	$4, 007, 556	$4, 342, 002
France	....	....	....	181, 181	....	....	260, 010	291, 690	312, 984	357, 696	438, 600
United States	12, 586, 428	13, 540, 160	12, 465, 900	15, 211, 800	16, 072, 020	11, 994, 480	16, 590, 376	17, 232, 160	13, 176, 432	13, 102, 560	12, 052, 353
Canada	3, 285, 360	3, 810, 726	3, 271, 266	2, 935, 440	2, 752, 704	2, 629, 902	3, 727, 704	4, 104, 756	5, 224, 986	6, 175, 470	7, 273, 301
Elsewhere	258, 783	295, 327	273, 278	73, 832	265, 288	348, 875	269, 314	172, 234	162, 206	124, 062	201, 688
Total	21, 791, 885	22, 888, 209	20, 595, 528	23, 188, 867	24, 040, 894	18, 584, 723	23, 786, 920	25, 491, 260	23, 084, 368	23, 767, 344	24, 307, 944

c.—*Price per pound in each year.*

Imported from—	1874.	1875.*	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.
	Cents.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
Holland	12. 67	12. 65	11. 38	12. 49	12. 44	11. 72	12. 22	12. 24	12. 09	12. 19	12. 13
France	....	....	....	16. 82	....	....	14. 76	14. 18	13. 96	14. 49	14. 44
United States	13. 36	12. 60	11. 86	12. 87	10. 66	8. 81	12. 64	12. 39	12. 14	11. 81	11. 02
Canada	13. 26	12. 17	11. 68	12. 24	9. 74	8. 46	11. 81	12. 24	12. 20	12. 55	11. 02
Elsewhere	15. 08	13. 84	15. 86	12. 54	15. 00	14. 12	13. 29	11. 64	15. 15	9. 64	9. 61
Total	13. 10	12. 56	12. 02	12. 52	10. 90	9. 27	11. 96	12. 30	12. 21	11. 79	11. 26

IX.—*Statement showing the exports from the Uuited States of cattle and cattle products during the year* 1884.

a.—*Horned cattle and beef.*

Exported to—	Cattle.		Fresh beef.		Canned beef.	Salted beef.		All other beef.	
	Quantity.	Value.	Quantity.	Value.		Quantity.	Value.	Quantity.	Value.
The continent of Europe:	*Number.*		*Pounds.*			*Pounds.*		*Pounds.*	
The United Kingdom	169, 257	$17, 336, 606	115, 601, 057	$11, 516, 369	$2, 542, 122	36, 831, 030	$2, 058, 383	572, 177	$60, 028
Germany	323	30, 200			158, 286	2, 446, 990	183, 482	4, 492	851
Belgium					26, 688	240, 292	19, 124	13, 890	1, 564
Denmark					7, 387	497, 625	32, 956	1, 600	160
France					25, 182	321, 560	21, 965	2, 875	303
Italy						10, 069	669		
Holland					55, 907	675, 892	55, 538	16, 245	1, 739
Spain					67				
Sweden and Norway					1, 980	490, 840	38, 440		
Total to Europe	169, 580	17, 366, 806	115, 601, 057	11, 516, 369	2, 817, 619	31, 514, 298	2, 410, 557	611, 279	64, 645
The continent of America:									
Argentine Republic					315	100	13		
Brazil					13, 748	110, 100	8, 961	400	42
Central American States					8, 077	164, 306	13, 224	4, 918	438
Chili					1, 287	5, 200	395	500	60
Danish West Indies					161	92, 970	5, 948	2, 023	226
French possessions					883	945, 900	69, 605	2, 924	324
Canada	3, 475	96, 820	5, 029, 161	455, 003	250, 354	3, 990, 470	261, 665	7, 660	485
British West Indies	1, 135	98, 968			8, 703	2, 231, 018	177, 194	7, 285	952
British Guiana					237	888, 095	72, 343	800	110
British Honduras					699	76, 085	5, 677		
Hayti					883	223, 419	19, 094	202	27
Mexico	8, 093	128, 630			2, 540	3, 746	325	1, 028	140
Dutch possessions					1, 073	268, 409	21, 882	385	65
Peru					1, 208	58, 308	4, 728		
San Domingo					630	8, 614	711	369	55
Spanish West Indies	8, 015	145, 024			1, 577	98, 665	8, 495	646	97
United States of Colombia					3, 790	442, 489	35, 108		
Uruguay						4, 000	280		
Venezuela					1, 771	40, 870	3, 286	674	90
Total to America	20, 718	469, 442	5, 029, 161	455, 003	297, 936	9, 652, 764	708, 934	29, 814	3, 111
The continent of Asia:									
China					1, 287	119, 200	8, 755		
British India					86	4, 500	380		

IX.—*Statement showing the exports from the United States of cattle and cattle products during the year* 1884—Continued.

a.—*Horned cattle and beef*—Continued.

Exported to—	Cattle.		Fresh beef.		Canned beef.	Salted beef.		All other beef.	
	Quantity.	Value.	Quantity.	Value.		Quantity.	Value.	Quantity.	Value.
	Number.		*Pounds.*			*Pounds.*		*Pounds.*	
The continent of Asia—Continued.									
Hong-Kong					$11,497	109,700	$8,494		
Japan					3,230	34,200	2,608		
Russia in Asia					150	47,600	3,984		
Total to Asia					16,250	313,200	24,221		
The continent of Africa:									
French Africa					17,409	146,290	10,674		
British Africa						56,500	3,701		
Liberia					39	600	38		
Spanish Africa					64	24,000	1,260		
Total to Africa					17,512		15,673		
Not designated	220	$19,247	153,846	$15,959	24,411	672,254	42,891	50	$2
Grand total	190,518	17,855,495	120,784,064	11,987,331	3,173,767	42,379,911	3,202,275	641,163	67,758

IX.—*Statement showing the exports from the United States of cattle and cattle products during the year* 1884—Continued.

b.—*Butter. cheese, beef tallow, and oleomargarine.*

Exported to—	Butter.		Cheese.		Beef tallow.		Oleomargarine.		Grand total, cattle and cattle products.
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
The continent of Europe:	*Pounds.*		*Pounds.*		*Pounds.*		*Pounds.*		
The United Kingdom	9, 591, 337	$1, 876, 341	102, 686, 547	$10, 508, 526	38, 627, 679	$2, 941, 008	1, 967, 263	$209, 020	$49, 048, 403
Belgium	17, 626	2, 973			3, 930, 361	270, 838	2, 865, 783	358, 973	680, 160
Denmark	421, 377	60, 005			319, 610	22, 726	32, 614	4, 200	127, 434
France	64, 409	13, 794	3, 888	420	8, 514, 737	686, 551			748, 215
Germany	2, 840, 757	418, 329	79, 661	2, 806	2, 044 785	155, 075	127, 341	14, 471	963, 500
Italy					776, 511	61, 585			62, 254
Holland	11, 840	1, 342	113	15	3, 251, 034	241. 468	35, 173, 819	4, 127, 827	4, 483, 836
Portugal	142	28			172, 138	12, 734			12, 762
Russia					70, 124	5, 337			5, 337
Spain									67
Gibraltar	709	211							211
Sweden and Norway	370, 371	55, 680							96, 100
Total to Europe	13, 318, 568	2, 428, 703	102, 770, 209	10, 511, 767	57, 706, 979	4, 397, 322	38, 166, 820	4, 714, 491	56, 228, 279
The continent of America:									
The Argentine Republic	2, 040	400							728
Brazil	299, 253	56, 960	570	96	8, 872	679			80, 486
Central American States	59, 434	13, 046	30, 940	4, 300	451, 171	37, 749	865	158	76, 992
Chili	6, 354	1, 399			5, 176	427			3, 508
Danish West Indies	161, 744	25, 110	42, 360	4, 833	1, 402	147	6, 104	776	36, 701
French possessions	623, 316	87, 492	3, 992	491	1, 321	119	927	128	159, 042
Canada	1. 825, 496	346, 199	8, 303, 396	895, 290	3, 249, 409	216, 368	1, 062, 369	113, 334	2, 635, 418
British West Indies	1, 800, 034	308, 147	621, 108	84, 316	44, 785	3, 850	39, 761	6, 029	688, 159
British Guiana	122, 279	20, 115	185, 154	24, 702	102, 410	8, 600			126, 107
British Honduras	68, 407	13, 689	32, 058	4, 336	216	21			24, 422
Hayti	348, 816	63, 654	43, 591	6, 615	114, 109	9, 696			99, 969
Mexico	102, 460	23, 435	59, 267	9, 965	443, 718	38, 006	9, 280	1, 179	204, 220
Dutch Possessions	172, 165	30, 881	7, 109	1, 042	12, 915	1, 273			56, 612
Peru	13, 156	2, 591			62, 901	4, 946			13, 473
San Domingo	132, 252	23, 654	58, 047	9, 397	391, 577	31, 854			66, 301
Spanish West Indies	441, 288	75, 457	295, 260	45, 608	100, 200	7, 993	372	55	284, 306
The United States of Colombia	377, 483	71, 497	210, 013	30, 791	266, 088	22, 687			163, 873
Venezuela	368, 057	70, 858	1, 302	2, 254	115, 216	9, 807			88, 066
Total to America	6, 924 034	1, 234, 524	9, 905, 886	1, 123, 536	5, 371,486	394, 222	1, 119, 678	121, 659	4, 807, 987

IX.—*Statement showing the exports from the United States of cattle and cattle products during the year* 1884—Continued.

b.—*Butter, cheese, beef tallow, and oleomargarine*—Continued.

Exported to—	Butter.		Cheese.		Beef tallow.		Oleomargarine.		Grand total, cattle and cattle products.
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
	Pounds.		*Pounds.*		*Pounds.*		*Pounds.*		
The continent of Asia:									
China	15,089	$3,514	24,027	$3,686	....	....	....	....	$17,242
Hong-Kong	8,109	1,809	34,459	5,168	....	....	....	....	26,968
Japan	90,243	19,124	22,322	3,630	....	....	....	....	28,592
Russia in Asia	4,586	1,158	1,276	233	....	....	....	....	5,525
British Possessions	....	....	....	....	....	....	....	....	466
Total to Asia	118,027	25,605	82,084	12,717	....	....	....	....	78,793
The continent of Africa:									
French Possessions	....	....	....	....	....	....	....	....	1,324
British Africa	54,026	9,849	208	38	....	....	6,000	$560	38,530
Liberia	2,194	612	1,311	242	....	....	....	....	4,555
Spanish Possessions	100	18	....	....	....	....	....	....	95
Total to Africa	56,320	10,479	1,519	280	....	....	6,000	560	44,504
Not designated	210,425	51,400	109,863	15,403	12,638	$1,831	30,403	5,652	177,284
Grand total	20,627,374	3,750,771	112,869,575	11,663,713	63,091,103	4,793,375	39,322,841	4,842,362	61,366,847

CATTLE-BREEDING IN EUROPE AND IN THE UNITED STATES.

REPORT BY CONSUL TANNER, OF LIEGE, BELGIUM.

It is my opinion that if a fair test were made of the merits of cattle but little known, including the Belgian breeds, it would be discovered that the "craze" for so-called blooded breeds is a great mistake, and that Americans pay enormous and absurd prices for foreign cattle. These things, it is to be hoped, will be rectified by the reports in answer to the cattle circular.

I believe that if our people at home would use the money spent in the purchase of foreign breeding cattle in constructing quarters for our native cattle equal to the housing quarters of Europe; if they would give the native cattle the same care they give to their high-priced foreign cattle, that within four generations of careful breeding, always selecting the best bulls and the best cows and keeping the others thinned out by the butchers, the United States would have a native breed that would rival any cattle in the world.

If those who pay extravagant prices for foreign cattle will carefully note what it costs to feed and keep such cattle in good condition; the risks and losses in transportation; will keep a careful record of their milk-yield in comparison with the best of our native breeds, giving both the same care and attention, and add up their accounts at the end of the year, bearing in mind the interest on the money invested in the foreign stock, they will find the balance on the side of the native cattle.

In cattle the rule of the "survival of the fittest" should be adopted. An inferior cow should be sent to the butcher as speedily as possible.

If the assertion of the Dutch historian be true that William, Prince of Orange, found that the cattle of England were inferior to those of Holland, it shows that the improvement in British cattle is of recent date.

I might offer a hundred illustrations from my own observations and experience, which would fortify the assertion that our native cattle can be brought to a degree of perfection existing in the cattle of European countries if they will be surrounded by similar conditions.

My brother took much interest in matters of this kind, and made many experiments. The results of twelve years of careful selection of the best native cows and bulls proved that there was only a slight difference between these and the fancy imported cattle, and when the difference in price was taken into account the balance was in favor of the home breeds.

The first Jockey Club that was ever inaugurated was gotten up by the father of Senator Wade Hampton, of South Carolina. What has this Jockey Club not done for the American race and trotting horse? It has not only elevated the standard of this breed of horses by offering sufficient inducement to that end in the United States, but it has done the same in European countries which have followed the example of South Carolina. It has greatly increased the speed in running in the one, and it has made the trotting horse, which is peculiar to the United States, almost equal to what the running horse was prior to the formation of this Jockey Club. This only applies as an illustration for the subject on hand thus far. The race horse, it is true, comes from a foreign breed, but the trotting horse has been developed therefrom by selection and careful breeding. This shows that where man bends his energies to the development of cattle for any particular quality he is sure to succeed. With similar rules applied in the breeding of even our scrub cattle, I know whereof I speak when I assert that they will develop qualities, as beef and milk yielders, equal to those possessed by the imported stock.

CARE OF CATTLE IN EUROPE AND IN THE UNITED STATES.

As a whole the European people take more interest in their stock than do the people of the United States, and there are more inducements in this regard offered in the former than in the latter. The English hold a dozen agricultural or cattle shows to our one, offering thousands of dollars to our half dollars in premiums, and it is no marvel that the cattle are far superior, that the farmer in England should draw closer to his cattle than does the American farmer to his, treat them kindlier, and give them better dispositions.

Stock-raising, by common consent, seems to have fallen to the lot of the farmer, whereas it should be a special calling; for if it is not an interest of importance enough for the exercise of special talents, it certainly posseses so many phases that some of them suffer from the divided attention which the farmer is compelled to give his other interests. The size and betterment generally of a grain of corn might be much increased if the farmer would make corn a specialty, and thoroughly understood the subject of corn-growing in all its bearings. In having so many interests on his hands one or all of them must suffer.

It is a well-recognized fact in Belgium, and in Europe generally, where interest of the keenest kind is taken in cattle, that there is nothing so injurious to a cow giving milk as to run her, or excite her in any manner, and yet how frequently are reckless boys, with their dogs and whips, sent to drive the cattle home in the United States.

These things, and hundreds of others equally important, never trouble the brains of the American farmer, because his head is full of other matters connected with his calling. How many farmers in the United States can tell how much hay, or other food, is given to each cow during the year and the cost of the same, and the return therefor in milk, butter, and cheese—in fine, does he know if each cow is paying for her outlay, and if so, how much? Perhaps a small number could intelligently answer these questions. It is entirely different in England and on the Continent. There and here a farmer knows his cows as well as if they were a portion of his family. He balances his accounts regularly and knows, at all times, how much he is losing or gaining by each cow. He can tell you the food best adapted to each cow's taste, and which will contribute most to her milk yield.

He knows her exact age, knows when it is best for her to breed, and, above all, the care and attention she demands at his hands, and he gives it to her, knowing, as he does, that by so doing she will return all a hundred-fold to him in the shape of milk. Milk is the first and chief aim and end of a cow's subsistence, and beef the last. If she receives the best nourishing food, is not exercised too violently, and is properly cared for, she will yield a rich supply of milk for a half a dozen years or a little more, and then leave a fine carcass for the butcher. She should give 600 gallons of milk per annum, and she will do it if we will do our part towards making her do it. For the 600 gallons of milk that she gives us, care and attention are all she asks from us. This is not only true of one race of cows, but it is true of all, the scrub as well as the finest. This is what the English have long since realized, and this is the history of the fine breeds of cattle in Europe. They are fine because they have been bred up to it by care and kindness.

The American who comes to Europe and pays $10,000 or $15,000 for a bull or cow may be truly considered, as he is in England, as having "the American craze for English cattle." The question of breed is a rational one, but why should he want to pay such extravagant prices to England for doing that which he can do himself? The history of all breeds of cattle, sheep, horses, mules, dogs, and cats show this. The breeding of stock not only pays well, but it is a business of absorbing interest. A farmer should have an eye single to these qualities in his cattle, the calf, the milk, and the beef, each of which has a high value of its own, and each can be developed in exact proportion to a man's efforts to develop them. Those who develop the greater number of these requisites to the highest degree of perfection will be those who succeed best with breed, with milk, with beef, and in a pecuniary point of view. Care and attention are the foundation of success, and thereupon is laid the superstructure of the requisites mentioned, a superstructure which is perennially repeating itself, improving or deteriorating as the foundation is kept in repair, is strengthened and improved.

Few farmers in America are there who have a genius or even taste for selection and classification of animals, but at the same time by drawing nearer their cattle, and observing them closely, and studying their wants, it would be strange indeed if a marked change for the better were not soon perceived in our own home breeds without dashing them with foreign stock. With the care and attention given to cattle in England and on the Continent, compared with the slip-shod manner of treating them in the United States, it is in no way strange that there should be the difference that is so palpable. With the personal attention, feed, &c., in Belgium a cow will cost her owner at least $108 per year. If she gives six hundred gallons of milk in that time she pays for her maintenance and attention many times, and most of the cows here do it. If you were to tell an American farmer that he must spend $108 per year on his cow he would want to consign you to a lunatic asylum at once.

THE COST OF PRODUCING FINE CATTLE IN ENGLAND.

The following will give an idea of what it costs in England to have fine cattle. I quote from the Farmers' (London) Journal:

> The cows are kept under cover for about six months, and are tied up in pairs, 40 in one house and about ten in another. The urine runs into a large underground tank, from which, when full, it is carried on to the pasture by a water-cart. The food of the cows varies with their condition, and the more milk they are giving the higher they are fed; but when dry, or nearly so, they have only roots and hay or straw, unless it is decided not to keep them for the purposes of the dairy, in which case they are milked and fattened at the same time. When fat they sell for about $150. The following is the amount of food, in tons, consumed by the cows while in the stalls:

Cotton cake	13
Barley meal	11½
Bran	10½
Chaff (⅓ hay, ⅔ straw)	70
Mangels, pulped	224

In addition to this, 13 tons of cotton cake are used during the summer. It is somewhat difficult to estimate the number of acres of pasture used by this herd, as the cows have the first run of the grass, and the coarser and rougher part of the pasture is fed by other stock. Possibly each cow may consume the produce of 1½ acres.

In the winter months the milk sells for about 22 cents per gallon, a price which is hardly more than sufficient to cover the cost of the food and attendance, so that the dairy does not often get back more than the manure free of cost. The annual expense of labor upon each cow amounts to about £2 15s.

The following are the prices of some of the foods enumerated above:

QUOTATIONS.

	£	s.	d.
Phœnix pure linseed cake, per ton	9	10	0
Phœnix pure undecorticated cotton-cake (future delivery), per ton	6	5	0
Yellow rape cake, per ton	6	10	0
Phœnix pure linseed meal (in bags), per ton	10	5	0
Phœnix pure cotton-seed meal, per ton	7	0	0
Yellow rape meal or nuts, per ton	7	5	0
Phœnix pure palm-nut meal, per ton	7	0	0
Decorticated cotton-cake, per ton	6	17	6
Decorticated cotton meal, per ton	7	10	0
Clean sieved linseed, suitable for feeding purposes, per 416 pounds in bags	0	52	0

	Per ton.						
Linseed cake:	£	s.	d.		£	s.	d.
Best quality, English	8	10	0	to	8	15	0
American thin	8	0	0		8	10	0
Other qualities English	8	5	0		8	10	0
American	7	15	0		8	0	0
Marseilles	7	12	6		7	15	0
Rape cake, East India seed	5	15	0		6	0	0
other descriptions	0	0	0		0	0	0
Cotton cake, best London undecorticated	5	12	6		6	0	0
Cotton cake, decorticated	0	0	0		0	0	0
Corn and mixed cake, English make	7	10	0		8	10	0
Palm-nut meal	5	10	0		6	0	0
Locust beans	5	5	0		6	0	0
Rice schudes, whole	2	10	0		3	0	0
ground	3	10	0		4	10	0

A little addition here on the part of the American farmer will open his eyes to many very startling things. It will show him that a cow in England gives a large and rich quantity of milk, but it shows also that she would not be a paying institution for the American. The example given above will have to be taken as an illustration, though in my opinion many breeders of fine cattle feed much higher than those above mentioned. The following, taken from the same journal, will bear me out in this:

Mr. R. E. Turnbull, of Twyer's Wood Farm, Hedon, Hull, who has gained the royal prize for having the best-managed dairy farm in Yorkshire, although having good pastures, which produce a high quality herbage, invariably supplements it with artificial food. Now, as the generality of dairy farmers on even comparatively poor pastures do nothing of the kind, the fact appears worth knowing that Mr. Turnbull considers himself amply repaid for his enterprise, although carried out to an extent of surprising liberality. From May 1 to October 21 the allowance of cake, half linseed and half decorticated cotton, is from 2½ to 7 pounds per animal per day, according to size and age, while in July they have green tares and in August and September cabbages in addition. Of course during winter the allowance to cows and heifers yielding milk is still greater, comprising for cows 3 pounds of linseed cake and some 3½ to 7 pounds each of crushed oats per day; and heifers 5 pounds each either of oil-cake—one-half linseed, the other half cotton—or equal proportions of linseed cake and crushed oats. The other winter food consists of pulped roots and hay partly chaffed, or when oat straw is good it is used as a substitute for hay, 10 pounds of oat straw being considered an equivalent for 7 pounds of hay. Mr. Turnbull makes a good price for his milk partly by retail sale in Hull and partly by conversion to high-class butter, which sells for 1*s*. 7*d*. per pound, and he calculates that he realizes 10*d*. per gallon for all his milk to whichever purpose applied. His summer average in quantity is 10¼ quarts per cow and in winter 8 quarts per cow per day.

Probably the publication of facts in relation to the management on this farm will lead to the conviction being entertained that dairy farmers in general do not feed high enough. This is especially true of those who convert their milk to butter. Their profits thoroughly depend on the *high quality, not quantity, of the milk*—the large proportion and thickness of the cream. Consequently the addition of some oil-cake or maize meal to the ordinary food would be almost sure to pay, yet it is undeniable that on wretchedly poor pastures milch cows are seldom, in ordinary farming, allowed cotton cake, maize meal, or anything else supplementary, although the milk they yield is appropriated to butter-making. A farmer of the advanced school said a little time since, "I cannot afford to let my cows which yield milk feed on grass alone," uttering these words because he saw that parsimony in their feeding would be the greatest possible extravagance. A similar rule applies almost throughout the entire domain of farm husbandry, for not only the most liberal feeding, but bountiful manuring and highest management, will be found in most cases to be attended with the greatest economy.

This feeding I have no doubt will astonish the American farmer, but it has made the English cattle "blooded cattle." The following, relating to the same subject, will further demonstrate the importance of this subject. It admits the Americans who are in search of English catttle behind the scenes, as it were.

A CAUTION TO GALLOWAY BREEDERS.

Galloway breeders have special reasons at the present time why they should be careful to leave uncastrated only such beasts as will do credit to the breed. While some American stockmen have begun to purchase Galloways on the well-founded idea that they are especially adapted to their severe and variable climate, yet the reputation of the breed as a beef-producing race of cattle has yet to be fairly and widely established on the other side of the Atlantic. In many instances owners of ranches are only making inquiries regarding them, and if inferior specimens, especially bulls, are exported, the ultimate success of the breed will be seriously injured thereby. They will be judged by the samples that are sent out, and if these compare unfavorably with the Shorthorns, Herefords, Polled Angus, and other varieties with which they are already acquainted to some extent, the reputation of the Galloways will suffer in a proportionate degree. Let owners of herds retain as bulls only those calves whose personal merit is good. Apart from the question of personal merit, if too many are kept the market will be overstocked and prices will be affected thereby. When once the reputation of the breed has been firmly established in the Western States, it will be impossible to produce too many, provided they are personally of sufficient merit, for the plains to be stocked are practically illimitable. But in the mean time this state of matters has not yet been reached.

Moreover, breeders of pedigree Galloways must make up their minds to feed their young cattle much more liberally than most of them have been in the habit of doing. And this remark applies to heifers as much as, if not even more so than, to bulls. In regard to the latter, it has long been known that if calves were not extra well kept they would not be fit for service when yearlings, and hence, not being marketable at that age, a whole year's keep of them was lost. This fact insured bull calves being fed liberally in almost every instance. But, with comparatively few exceptions, heifers have been very sparingly fed. It has not been customary to have Galloway heifers dropping their calves until they are three years of age, and this has afforded ample time to bring them to maturity by slow degrees. But the circumstances are now entirely different. Breeders of pedigree Galloways must look to the American market for purchasers. It is not probable that American stockmen will put Galloway heifers to breeding purposes at an earlier age than is done in this country, but it must be borne in mind that when our Blackskins are taken to the other side of the Atlantic they are put alongside of animals of other beef-producing breeds of the same age, and if they are not as well grown and as forward generally as these, their reputation cannot but suffer in a corresponding degree.

The breeds with which they are brought into comparison in this way are the shorthorn, the Hereford, and the Polled Angus. Every one of these has been liberally fed, and even pampered, and therefore it is a severe ordeal to which the Galloways have to be subjected in this respect. If, therefore, the breeders of the south country Blackskins are to do justice to their favorites, and, indeed, if they are to be true to their own interests, they must adopt a much more liberal system of feeding, and that, too, from the very first, than has hitherto been customary among the rank and file of them. We do not, indeed, advocate any measure of pampering, which might make the beasts more tender, and lessen that hardiness which has been one of their most valuable characteristics from time immemorial. But there is a moderate degree of steady good keeping which is quite compatible with the safe preservation of all the distinctive and valuable characteristics of the breed, and it is this systematic liberal feeding, even from calfhood, which we advocate. Quality, of course, is important and desirable, but the American purchasers put great stress upon size, and this cannot be attained without a steady liberal diet.—*Dumfries* (*Scotland*) *Courier*.

As I consider this subject one of first importance to the American stock-raiser, I feel that it cannot be pursued too far.

FEEDING-STUFFS.

This was the subject of a very instructive lecture delivered in the Guild Hall, on Friday week, by Dr. Macadam, Edinburgh, under the auspices of the Strathearn Central Agricultural Society.

Dr. Macadam remarked that the food of the animal had three functions to fulfill. First, to supply combustible matter or fuel to be burned within the living organism, and thus keep up the animal warmth; secondly, to replenish the wear and tear of flesh atoms; and, thirdly, to contribute extra fatty matter and flesh atoms to be stored up in the animal structure so as to increase the build and weight of the animal. Besides these, there are the elements of bone matter and other saline substances. The main natural feeding-stuff must always be ordinary pasture, and the experience of every agriculturist points to a decided difference in the nourishing properties of the pasture of one field or district as compared with that of another. This difference is due to the varying proportion of water present. In natural grass the water present ranges from 70 to 90 per cent. The best grass in ordinary dry seams or dry soil contains about 70 per cent., whilst, in rainy seams or damp soils the water is increased to 80 per cent.; and in the produce of irrigated field pastures the water runs as high as 90 per cent. of the weight of the succulent grass. Consequently, it follows that of every 10 pounds of grass from 7 to 9 pounds consist of water, and in the average only one-fifth of the total weight consists of dry feeding material. When the grass is air-dried and becomes hay, the proportion of moisture is reduced to about 16 per cent., so that only one-sixth of hay consists of water, and 1 ton of hay contains the solid, dry, nourishing elements of fully 4 tons of ordinary pasture grass. Turnips contain even a larger average proportion of water, for 90 per cent. of ordinary turnips consist of water; so that in every 10 pounds of turnip there is only 1 pound of dry feeding-stuff. Potatoes contain 75 per cent. of water, being equal to three-fourths of their entire weight. The cereals contain much less water, the average proportion in wheat, oats, &c., being 15 per cent., or less than one-sixth of their whole weight; so that five-sixths consist of dry feeding material. In linseed-cake and other cakes the moisture averages 12 per cent., so that one-eighth of the weight only consists of water, and seven-eighths of dry feeding-stuff. Considering, therefore, the question of food thereby in the light of the relative amount of dry solid matter in a given weight of the respective articles consumed by the animal, it follows that to obtain sufficient dry solid food the animal may partake of 1 pound 2 ounces of feeding-cake; 1 pound 3 ounces of cereals or air-dried hay; 4 pounds of potatoes; 5 pounds of ordinary dry pasture; 10 pounds of succulent grass from irrigated fields, and 10 pounds of turnips. When the respective qualities of dry feeding materials are considered, the nourishing properties of the natural and artificial feeding-stuffs vary even in a greater ratio than the percentage of moisture. Thus the proportion of flesh-forming or albuminous matters present in ordinary grass and clover averaged 2½ to 3 per cent.; in hay, 10 to 12 per cent.; in oats, 16 per cent.; in beans, 20 per cent.; in potatoes, 2¼ per cent.; in turnips, three-fourths per cent.; and in linseed and rape cakes, 25 per cent. It followed, therefore, that in 1 ton of cake there was as much flesh-forming matter as in 1½ tons of oats, or 2¼ tons of hay, or 8 tons of ordinary pasture, or 11 tons of potatoes, or 33 tons of turnips; and an ox or sheep would require to consume these respective quantities of the feeding-stuffs in order to obtain a similar amount of flesh-forming or albuminous matter. At the same time, however, it might be remembered that the amylaceous or starch group of compounds, which formed a very large proportion of natural and artificial vegetable food, played also an important part in the sustenance of the animal. It was very questionable how far the richer and flesh-forming foods, such as feeding-cakes, could be employed with safety in the rearing and fattening of stock without large admixture with the less nutritious kinds of food. An excessive quantity of cake not only led to injurious results in the health of cattle and stock, but determined much waste of nutritious matter, which passed through the animal system with the sole result of enriching the manure.

I have considered this subject of sufficient importance to make inquiries concerning it in England. A friend in that country sends me the following newspaper extract, which I hope may prove of some value at home:

EXPERIMENTS IN FATTENING STEERS.

Professor Brown, experimental superintendent of the Ontario Agricultural College, writes in his official report on the above subject:

In speaking of the weight of a fattened steer, and the daily increase it makes, we have to consider breed, weight of calf when dropped, food, management, and age. The nearer birth the greater the daily rate until the calf weight is lost among the tens-of-hundreds. Thus, a calf weighing 750 pounds is due about 10 per cent. to its birth weight; the yearling that weighs 1,000, 7½ per cent.; the two-year-old scaling 1,500, 5 per cent.; and the finished, or rather the over-fed, show beast of 2,000 pounds can only record about three and three-fourths of its weight as obtained from the average birth-weight of 75 pounds. Until the animal, therefore, is over 1,000 pounds, we should always remember the effect of this birth-weight; thereafter it may be left out of calculation.

The example I wish to submit to our breeders and feeders now, is that of a pure white, thoroughbred shorthorn steer, calved 6th May, 1881, bred by Mr. Hudson, of Myrtle, and bought by us from Mr. Hope, of Bow Park. On the 9th of April, when 703 days old, it weighed 1,710 pounds, which, of course, gives a daily rate of 2.43 pounds; the calf-weight from this would reduce the actual daily increase to 2.33 pounds; something, no doubt, but not enough to interfere when understood in practice. A yearling steer over 1,700 pounds is unquestionably a fine example of what breed, food, and management can do, and if we do not spoil him he should scale 2,000 pounds when two years and four months old, at the Provincial Exhibition at Guelph, on 25th September.

Some interesting experiments were also made for beef and milk with Hereford and Aberdeen poll grade steer calves. On this phase of the Canadian experiments Professor Brown says:

Having now got over the initiatory work of establishing herds, and acclimatizing breeds, we are diverting considerable attention to the making of grades for milk and beef respectively. Our progress in milk experiments is in advance of the other, as evidenced in previous reports, as also is this advance issue. We make no excuse for this. Our past beefing experiments have been with high-graded shorthorns, and the facts, to date, are sufficient to base upon in any comparison with other grades, as we will have to do when time calls; and what I wish to do is to place on record what our farm has on hand for such a purpose. The same cows, well-graded shorthorns, averaging six years, that have been used to produce the steers, with a thorough-bred shorthorn bull, were selected to mate with the Hereford and Aberdeen poll bulls. Necessarily, one of the difficulties is to arrange about equal birth-dates, and another is to get bull-calves. We have been more fortunate with the latter than the former, as shown by the following list:

Hereford grade steers: 9th April, 1882, Huntingdon, No. 184 (ear label); 6th October, 1882, Heathfield, No. 193 (ear label); 28th October, 1882, Hartford, No. 191 (ear label).

Aberdeen poll grade steers: 24th June, 1882, Aberdeen, No. 183; 27th June, 1882, Aboyne, 179: 2d August, 1882, Abernethy, No. 182.

The average Hereford steer is, therefore, thirty-four days younger than the Aberdeen poll average, and this must be most carefully noted in all future reporting.

On 9th April, 1883, the earliest birth of the lot, when a Hereford was one year old, weights, ages in days, and daily rates were as follows:

Description.	Weight, 9th April, 1883.	Age in days.	Daily rate of increase.
Hereford:	*Pounds.*		*Pounds.*
Huntingdon	790	365	2.16
Heathfield	552	185	3.00
Hartford	492	163	3.02
Aberdeen poll:			
Aberdeen	740	289	2.56
Aboyne	750	286	2.60
Abernethy	670	243	2.75

A mean of 2.73 for the Hereford and 2.64 for the Aberdeen poll.

FEEDING CATTLE ON TURNIPS.

The following are the results of an interesting experiment made by Mr. Robert Logan, Birkenside, Earlston, with the view of testing the comparative merits of sliced and pulped turnips as a feed for cattle: On the 11th of October, 1882, three Canadian bullocks, live weight 32 cwt., 3 quarters, were bought for £64 5 *s*., or 39*s*. 2½*d*. per cwt., live weight. On February 6, 1883, the same animals were sold at Haymarket, Edinburgh, live weight 43 cwt., 14 pounds, for £105, or 48*s*. 8*d*. per cwt., live weight. The gain in weight was 10 cwt., 1 quarter, 14 pounds; in money, £40 15*s*. These bullocks were fed on sliced turnips, of which they consumed 218 pounds per 24 hours. On October 11, 1882, a second lot of three Canadian bullocks, live weight, 31 cwt., 2 quarters, were bought for £61 15*s*., or 39*s*. 2½*d*. per cwt., live weight. On February 6, 1883, these were sold at Haymarket, live weight, 39 cwt., 2 quarters, 11 pounds, for £101, or 51*s*., per cwt., live weight, the gain in weight having been 8 cwt., 11 pounds; in money, £35 5*s*. These bullocks were fed on pulped turnips, of which they consumed 162 pounds per twenty-four hours. Lot 1 when slaughtered yielded 60 per cent. on gross live weight; lot 2 when slaughtered yielded 61 per cent. on gross live weight. Both lots were valued at the same price per cwt., according to their live weight on October 11. When sold according to live weight those fed on pulp made 2*s*. 4*d*. per cwt. more, and yielded one per cent. more beef. In addition to the weight of turnips given, as above stated, each lot were fed with the same proportion of hay; those fed on sliced turnips feeding it, in the ordinary way, from hecks; those fed on pulped turnips having it cut amongst the turnips. In addition each animal had 9 pounds of mixed cakes and bruised barley. The whole were fed in single boxes. Lot No. 1 made 10*s*. per head more than No. 2. The former, however, consumed 56 pounds more turnips per day than No. 2. The expense of pulping is slightly higher than slice feeding, but the value, per live weight and yield of beef, according to the same, favors pulp.

FOOD OF PREGNANT ANIMALS.

The food of pregnant animals is an important consideration. Creatures in this condition should be well fed, and especially if they have to acccomplish a certain amount of labor or yield milk. The appetite is generally increased, and there is a tendency to fatten. This tendency should be somewhat guarded against, as it may prove troublesome, particularly if allowed to proceed to an extreme degree, when it may retard the development of the fœtus, induce abortion, cause difficult parturition, or give rise to serious after consequences. This precaution is more to be observed in the second than the first half of pregnacy, when the food should be plentiful, but not in excess, and flesh more abundant in the animal than fat. The food should also be of good quality, very nutritive, easy of digestion, and not likely to induce constipation. Indigestion should be carefully guarded against, and unaccustomed, hard, damp, bulky, fermentable, moldy, or otherwise hurtfully altered food, should be avoided, as it is likely to prove indigestible, occasion tympanitis, and produce other injurious results.—*Fleming's Veterinary Obstetrics.*

FEEDING OF DAIRY COWS.

The honorable secretary of the Munster Dairy School, Cork, writing to a contemporary, says: There are sixteen cows in milk, calved three and four months. They were getting each daily from 5 to 7 pounds, according to yield, of following mixture: Decorticated cake, bran, and Indian corn meal, with four stone of mangels and hay. The return not proving satisfactory, I proposed the dietary should be as follows: 2 pounds bean meal, 2 pounds crushed oats, 3 pounds decorticated cake, 3½ stone mangels. This feeding was commenced on March 10. On March 23 the cows had to get fan-saved hay (musty). Note the result:

Date.	Total yield per week.	Set for cream.	Butter.	Date.	Total yield per week.	Set for cream.	Butter.
	Quarts.	*Quarts.*	*Pounds.*		*Quarts.*	*Quarts.*	*Pounds.*
March 3	1,065	948	67	March 24	1,078	1,056	73
March 10	1,043	977	66½	March 31	1,107	1,036	69
March 17	1,135	976	72				

Percentage of fat by lactobutyrometer: March 9, 2.56; March 29, 2.7.

These returns were carefully and accurately kept by Mr. Smith, the superintendent.

FATTENING AMERICAN CATTLE IN ENGLAND.

We see from these extracts what importance is attached to the subject of feeding in the country that is supposed to possess the best breeds of cattle in the world, and how thoroughly this subject is understood there. I submit these extracts because example is worth more than precept in matters of this kind. When I speak of England, however, in this connection, the same remarks apply equally to Europe entire. Perhaps nothing would go further to convince the American of his folly in the parsimony of his feeding, and the want of attention he gives his cattle, than to tell him that it frequently happens that the cattle he ships to England and to the Continent are taken in hand by European stock raisers after arrival and the European system of care and food applied to them and double profits are realized on them, when the American might have pocketed this by the same attention on his part, and at less expense, as his food is cheaper. If I had the space I might offer a hundred illustrations of this that have come within my own observation. This, however is the most satisfactory one:

AN AMERICAN OX.

In the first importation of live stock from America into Cardiff was a white Shorthorn ox, in the month of July. He was transferred by his purchaser to the pastures of Grange Farm, Mumbles, near Swansea, at £45. Here with an English cow for his companion he made good progress, won a prize in 1878, and at Christmas weighed 80 score 18 pounds, realizing for his feeder £67 8*s*. 4*d*.—*The London Standard.*

Persuasion, scolding, and argument are unnecessary to show our people their folly in their neglect of cattle when we have such examples as this. At a recent exhibition in Paris a Canadian cow was universally admired, and when I inquired to what breed she belonged, the Frenchman only shrugged his shoulders and said she came from America as common cattle, and that he had polished her up. "What did you do for her?" I inquired. "Well," says he, "I curried and brushed her every morning because she was dirty and rough; I fed her on the best cotton-seed cake, bran and hay, and kept her in the stall all the time. She has borne one calf since I have had her. As a milker she is not a success, but the calf will be on exhibition at the fair two years hence, and I am sure will take a premium; it is the first calf in France." The food enumerated here (indeed, all food) is two to one cheaper in the United States than it is in Europe. This must be, since we supply Europe with the articles that they value most as cattle food. With such facts placed before our people, it seems to me they can see wherein they fail, and that they have untold treasures in their home breeds of cattle if they will go to work properly to develop them. To what purpose is it that they should come to Europe and pay exorbitant prices for cattle if they allow them to deteriorate, as the above report shows they do?

EXERCISE FOR COWS.

Mr. L. B. Arnold says that the amount of exercise which an adult cow requires is but very little, and all she gets beyond what is necessary for her health occasions a draft upon her system which must be made up by extra feed or a loss in her milk product, or perhaps both effects may be apparent. Every expenditure of force, whether in locomotion or labor, is made at the expense of the food consumed by the animal exerting the force. There is no evasion of this rule, and he who causes his animals, whether milch cows or beasts of burden, to make exertions that could be avoided is wasting his means of profit. The man who, having a given load to move twenty miles, takes a path that will require twenty-five miles to reach his destination, is not more unwise than the dairyman who causes his cows to do 25 per cent. more traveling and exertion than is necessary to supply themselves with food. This may seem like spinning a fine thread, but it is the sum of such threads that determine the question of profit with the dairyman. The loss in milk production by more travel in grazing than is necessary for maintaining the health and vigor of a herd of cows is often very considerable. Very few herds are free from some loss in this direction. In woodland pastures, and rough and hilly ones, and in ranges necessarily large because the land is poor and feed scanty, the yield of milk is always inferior, being cut short by the long distances necessary to travel for gathering a supply of food. The loss in milk from feeding in pastures of such a character as to require cows to be all day in filling themselves may be plainly seen by any observant farmer. A difference of 25 or 30 per cent., and even of 50 per cent., will be easily made between such fare and a full supply of feed easy of access, either by grazing or by soiling.

Large ranges of pastures are not advisable for cows in milk. It is better to supply only pasture enough to furnish grazing till grass begins to fail from dry weather, and to supply the herd with soiling crops through the middle of the summer at least. The saving in land where land has much value is enough by this course to pay for all the extra labor it occasions, and the increase of milk which will be gained becomes a source of increased profit. One would hardly imagine, until he tries it, how much the yield of milk for the season will be augmented by such a course. In the first place, it saves the cows an immense deal of travel if they can have their feed presented to them in the stable or other convenient place, instead of their having to run after it. Then, it often saves them a great deal of depressing exposure to sun and storms and flies. They are enabled also to make better use of the food they consume, by reason of having more leisure for ruminating than they can have if they have to pick their living by constant travel. The sum of all these advantages has a telling effect upon the resources of the farmer, and he cannot afford to ignore them. If he has rough places, woodland, or thin pastures, which will afford only scanty feed, it is better to put young stock upon it to pick the scanty feed. They can use it without loss. They require considerable exercise to work off their surplus energies, and to promote growth of frame and assimilation, and they won't mind the travel necessary to gather the grass from such places. But the milch cow which has her energies taxed to the utmost to elaborate a bountiful flow of milk has no vital force to spare. She needs to husband to the best advantage all she has to enable her to do her full work, and the farmer who intelligently plans his operations will spare her all the exertions he possibly can.

CATTLE SHOWS IN ENGLAND.

If I enter on such particulars it is because I sympathize keenly with the Department in its efforts in behalf of American cattle, and because it seems to me that nothing would be more valuable to our breeders than the experience of countries that surpass us and have brought their cattle to such a high standard of perfection. There are other considerations that must not be ignored that have contributed to the advancement of the standard of European cattle, and to leave this consideration unmentioned would be to make my dispatch imperfect, viz, cattle shows or exhibitions. Apart from the interest and benefit that accrue to England from having fine cattle, the system observed in that country, and to a less extent on the Continent, of having what is called shows, offers additional stimulus and incentive to have fine cattle, that has caused the cattle of Europe to be *pushed*, as it were, to the high point which they have attained, and keeps them there. It has caused common stock to disappear entirely from Europe.

In England for every distinctive breed of cattle there is a society to look to the interest and its advancement This is done by shows and exhibitions. There is a Shorthorn society, a Jersey society, a Devon, a Southdown, and a Cart-horse society. Where such keen rivalry is excited as is done by these numerous societies, all having for their special aim the advancement of the different breeds, it is in no way curious that scrubby cattle of every kind have disappeared and that they have been converted into blooded cattle. This is a truth that it seems to me shows Americans that they have but to offer the same inducements to accomplish like results.

HOW CATTLE DEGENERATE.

Should the careful nursing, constant and minute attention, bestowed upon the English breeds of cattle be relaxed; should they become careless and indifferent, herd them together in vast numbers, and place care-takers over them that are reckless and vicious, within twenty years almost every trace of what is known as fine blooded cattle would be eradicated. As proof of this no better illustration could be offered than we find in the wild mongrel Texas herd. These cattle are unquestionably descendants of the Spanish stock introduced into Mexico by the early Spanish settlers towards the year 1500. We know from history that Mexico possessed no cattle or horses, because those ridden by Cortez and his band inspired superstitious reverence that was one of the chief factors in the easy conquest of Mexico. We know from history that both cattle and horses were imported by the Spaniards into Mexico. With a mild climate, forage in abundance, the absence of beasts of prey, and the negligence of man these cattle increased to a marvelous extent, but relapsed into their natural state and lost every trace of breeding that their ancestors had so highly possessed. It would not have been worth while for the Spaniards to import cattle to Mexico if they had been as inferior in quality as those of Texas; therefore we know with almost exactness that the cattle from which this mongrel race has sprung was the splendid stock of Spain, that now holds equal rank with the best breeds in Europe.

What lesson does this teach Americans? It shows them on the one hand what care and attention will do and on the other what negligence will undo. It shows them that the question of blood is a question of care and attention, and that we have untold treasures in the races of cattle that we now regard as scrubs.

IMPORTS OF BLOODED CATTLE INTO THE UNITED STATES.

Mr. Wade Hampton, sr., of South Carolina, was one of the first to import blooded cattle into the United States. These were cows and bulls of the Durham race. I think this was about the year 1782 or 1783. By careful attention this stock flourished and did exceedingly well. The common cattle of the neighborhood of Columbia, S. C., were dashed considerably by what was soon known as the "Hampton stock." I do not know the exact subsequent history of this stock, or whether there exists a trace of it now. It would be interesting and valuable to the Department to get a statement from Senator Hampton relating to this subject, as well as to others in the United States who are interested in the subject of breed. From such data one could form an opinion perhaps of how short a time is required for a breed of cattle to lose their distinctive qualities, and from that to judge of how long it requires for a breed to become pure. That which I have said here of cattle may be equally applied to our horses.

THE AMERICAN FARMERS AT FAULT.

With a virgin soil, a large area under cultivation, good seasons, and an abundant yield, life has gone so easy with the American farmer, that economic questions have not, up to this time, forced him to a study of these things, as it has in Europe, where density of population is so evenly balanced with the means of subsistence. There is a sad want of enterprise on his part; his progress has not kept equal pace with that of the mechanic, the artisan, and others in their productive achievements, when less mental and laborious efforts are required from him than any other calling to arrive at equally successful results. I am glad to see the Department taking time by the forelock, and doing for the farmer in its efforts to elevate the standard of our cattle, that which density of population will force succeeding generations to do.

Nearly all of our States have agricultural departments connected with their State governments. If each State would hold a series of fairs or exhibitions of all agricultural products, with liberal inducement in the shape of premiums for the best native breeds, requiring the exhibitor to give a full account of the father and mother of the cattle they exhibit, the mean temperature of the country from which the cattle came, the nature of the subsoil, food, and other things that would require a higher and more thorough knowledge on the part of the farmer concerning his cattle, it would go far to elevate the standard of home breeds. This is not speculative, it is a certainty, since the same system works so well in Europe.

I would recommend also to each of our State agricultural departments to purchase, say one hundred of the best of our common mongrel cattle, breed and care for them by the most approved methods, and try to solve the problem of how long it requires, with care, to make a breed of cattle pure. My reason for mentioning so great a number to experiment with is this: Out of one hundred cattle experiments could be made to develop certain qualities, such as those that would give the highest quantity of milk, like the Holsteins or Shorthorn; and others that would give the best quality of milk, like the Jersey; those that would give milk for a certain quality of cheese, like the Fletchet, &c. The results of these tests might be shown at a national or a permanent international exhibition, to be held in some central point, where all those who take an interest could see the result and benefit by it. From this number of cattle worthless cattle could be thinned out and the best retained to breed from.

I inclose list of "Agricultural shows"* held in England the present year. This does not include the different society shows, such as the Shorthorn Society, the Jersey, the Carthorse, and hundreds of other societies. We have two cattle to one in England, our population is nearly double that of England, and in intelligence and polish the American farmer is superior to the European, but in practical results he lags far behind.

THE AMERICAN CRAZE FOR ENGLISH CATTLE.

The English farmer finds another inducement in having fine cattle over those of our own country, and this is in "the American craze for English cattle," as this extract from the Times will show:

> The American demand has given Hereford cattle at heightened position and better prices, but the impetus has been nothing equal to that accorded to the Aberdeen Black Polls. The extraordinary advanced prices realized for the more fashionable strains of these last season are well known, and may appear likely enough to be fully sustained for some time to come. The dispersion of the Bridgend Polled herd on the 13th of September affords sufficient evidence of this, when some of the Pride strains were disposed of at marvelous figures. The Prides hold pretty much the same position among the Black Polls as Duchesses do to Shorthorns, and at the Tillyfour sale in 1880 Mr. R. C. Auld, the owner of the Bridgend herd, was tempted to give 270 guineas for a female of the tribe. At that time his investment was looked upon as almost as great a piece of folly as Mr. Platt's purchase of the Hereford bull Horace in 1876 at 500 guineas, or Lord Fitzhardinge's splendid bid of 4,500 guineas for Duke of Con-

---

* List published immediately following this report.

naught in 1875; and as to Mr. Auld's Pride of Aberdeen 9th, the animal having enriched the herd with three daughters since coming into his possession, all four were brought to the auction ring on the 13th of last month, and realized the magnificent sum of 1,365 guineas. Pride of Aberdeen 9th was bred by the late Mr. M'Combie, and formed one of his famous Parisian group at the Grand International Exhibition. She was purchased by Mr. Wilken for 385 guineas, but her yearling daughter realized 510 guineas, the highest price, it is said, yet given for a Polled animal. The purchaser of the latter was Mr. Walker, who was understood to have bought her for America.

While the demand for Herefords appears to be all-in-all for bulls, but nothing very extraordinary for cows and heifers, that for Aberdeen Black Polls gives a similar preeminence to females, as is to be found in sales of Shorthorns. Thus at the Bridgend auction now being referred to, 12 cows averaged £114 19*s*. 6*d*. each; 11 two-year-old heifers, £85 10*s*. 6*d*.; 8 yearling heifers, £156 3*s*. 9*d*., and 7 heifer calves, £90 7*s*. each, but the average for 2 two-year-old bulls was only £53 11*s*., and that for 11 bull-calves £29 4*s*. 2*d*., causing the general average for 51 animals, the total number sold, to be £90 16*s*., the sum realized being £4,631 11*s*. The North British Agriculturist gives the averages and highest individual prices of the principal tribes sold at this sale, which are as follows:

Tribes.	Average.	Highest price.
3 Vines	£99 8 0	£204 15
5 Prides	310 16 0	535 10
3 Jennets	116 4 0	199 10
19 descendants of the Queen foundation	72 14 7	183 15

This is how Americans make high feeding and good attention pay in England. With such prices an Englishman can well afford to feed and otherwise spend nearly $200 per annum on a cow or bull. In Europe apple and pear exhibitions are held, as well as egg and chicken exhibitions; in fine, there is as great a variety of exhibitions as there are articles to be devoured by man, all having for their *bent* the elevation of the standard of the article exhibited. Will it not occur on the same line of reasoning that Americans will one day go to England for their cats, dogs, fish, pears, apples, as for their cattle? Dogs have already been imported into America at extravagantly high prices paid in England. There is no telling where "a craze" will stop, once it begins. We have also committed the same folly in importing "blooded hogs." Think of "a blooded hog," so called because it was large, in fine order, and had the marks of care and attention, and easily palmed off on the American as "a blooded Berkshire."

If Congress would enact now that there would be opened in the year 1900 a grand international exhibition, and that a premium of $100,000 would be given for the finest exhibit of *native breeds* of all kinds, and the same for all breeds of cattle from every quarter of the world, I believe firmly that some enterprising American could take each premium; that is to say, he could take the premium not only offered for the American breed, but that the American cattle that had won the premium could compete with all foreign cattle and gain the second also. At any rate this is worth a trial, and $1,000,000 offered in premiums alone could not be better spent, as it would stimulate the American stock-breeder to the necessary effort to elevate the standard of native breeds.

GOVERNMENT ENCOURAGEMENT TO EUROPEAN STOCK.

All the exhibitions held in Europe are encouraged in every way by the King, Queen, Emperor, or what not, of the country in which the exhibition is held. The Queen of England exhibits cattle at every show in England, as does the Prince of Wales. A cow, the property of the

Queen, took second premium at a recent exhibition, and a bull third. No exhibition is too insignificant and unimportant in Belgium for the King and Queen of the Belgians to open in person and inspect personally each article and to encourage it by being an exhibitor of the product. This, it seems to me, is setting an excellent example to our governors and others at home who hold as high positions in public esteem and are looked to as much for examples. But, alas, politics is the all-engrossing topic with most of our governors and legislators, and anything that is outside of this is insipid to them; and, therefore, it is for the people, after all, to correct by politics the evils of politics, and to elect, and retain as long as possible when elected, men who will look to their interests and try, by wise legislation, to advance them.

I have abstained as much as possible, in this dispatch, from theorizing. I have advanced in its stead such methods as have accomplished the results we are in search of abroad. Example is worth more than precept; we have the example, and all that remains for us to do is to follow it, to achieve like results. By adopting these simple methods, within twenty years it would appear as absurd to us that we ever sent abroad for a bull, cow, sheep, dog, or hog as it does now that we imported the English sparrow.

GEORGE C. TANNER,
Consul.

Agricultural shows held in England during the year 1883, *exclusive of special society shows such as Shorthorn, Jersey, Cart-horse, &c., shows.*

Date of show.	Name of society.	Where held.	Nature of meeting.
May 26 to June 1.	Agricultural Hall Company, Limited.	Agricultural Hall, Islington.	Horses, implements, and miscellaneous articles.
May 28 to June 1.	Bath and West of England and Southern Counties.	Bridgwater	Horses, cattle, sheep, pigs, cheese, butter, poultry, and implements.
May 30	Royal Jersey	Jersey	Stock, implements, &c.
May 31	Eastern District of Stirlingshire.	Falkirk	Stock, implements, dairy produce, and poultry.
June 8	Stirling	Stirling	Do.
June 8	Ripon	Ripon	Stock, poultry, pigeons, dogs, &c.
June 12, 14	Herefordshire	Hereford	Stock, implements, &c.
June 26-29	Royal Counties (Hants and Berks).	Winchester	Do.
June 13, 14, 15	Wirral and Birkenhead	Birkenhead	Stock, poultry, pigeons, dogs, &c.
June 13, 14	Essex	Colchester	Stock and implements.
June 13, 14	Peterborough	Peterborough	Do.
June 19, 20	Marlborough and Pewsey Vale.	Newbury	Stock, &c.
June 19, 20, 21	Worcestershire	Worcester	Stock, implements, horses, hunters, &c.
June 20	Thorne	Thorne (Yorks)	Stock, implements, &c.
June 20, 21	Royal Cornwall	Truro	Stock and implements.
June 20, 21	Norfolk	Fakenham	Do.
June 21, 22	Northeast of Ireland	Belfast	Stock, implements, poultry, &c.
June 27, 28	Doncaster	Doncaster	Stock, implements, dogs, poultry, &c.
July 27, 28	Suffolk	Beccles	Stock and implements.
June 27, 28	Edinburgh	Edinburgh	Stock, implements, &c.
July —	United East Lothian	Haddington	Stock and implements.
July 5, 6, 7	Notts	Nottingham	Stock, implements, &c.
July 16-20	Royal Agricultural Society of England.	York	Do.
July 6	United Banffshire	Banff	Stock, implements, poultry, and dairy produce.
July 31	Malton	Malton	Stock and implements.
July 17	Stranraer and Rhins of Galloways.	Stranraer	Cattle, horses, sheep, &c.
July 10, 11, 12	Lincolnshire	Gainsborough	Stock, implements, and poultry.
July 13	Bedfordshire	Bedford	Horses, stock, and implements.
July 19	Royal Northern	Aberdeen	Stock, implements, poultry, and dairy produce.
July 24	Huntingdonshire	St. Ives	Stock, implements, poultry, &c.
July 24, 25, 26	Gloucestershire	Berkeley	Stock, implements, horticultural

Agricultural shows held in England during the year 1883, *&c.*—Continued.

Date of show.	Name of society.	Where held.	Nature of meeting.
July 25	Ormskirk, Southport, and Bootle.	Southport	Stock, implements, &c.
July 25, 26	Leicestershire	Melton Mowbray	Do.
July 25, 26	Glamorganshire	Pontypridd	Stock, implements, and poultry.
July 24–27	Highland and Agricultural of Scotland.	Inverness	Stock, implements, poultry, and dairy produce.
July 25, 26	Cambridgeshire and Isle of Ely.	Ely	Stock, poultry, implements, &c.
July 26	Barnsley	Barnsley	Stock, poultry, dogs, &c.
July 26	Cleveland	Saltburn-by-the Sea.	Stock, &c.
July 26	Tyneside	Hexham	Do.
July 27	Darlington	Darlington	Horse and dog.
July 28	Western District of Fife	Dunfermline	Stock, implements, and poultry.
July —	East Surrey	Croydon	Stock.
	Driffield and East Riding	No meeting for 1883.	Stock, poultry, pigeons, &c.
July 25, 26, 27	Shropshire and West Midland.	Whitchurch (Salop).	Stock and implements.
	Yorkshire	No meeting for 1883.	Stock, implements, &c.
Aug. 1	Crook	Crook	Stock, poultry, dogs, dairy produce, &c.
Aug. 1	Norton Farmers' Club	Chesterfield	Stock, &c.
Aug. 2	Coquetdale	Rothbury	Stock, implements, and poultry.
Aug. 3	Shropshire	Shifnal (Salop)	Stock, implements, &c.
Aug. 6	Border Union	Kelso	Stock and implements.
Aug. 29	Whitby	Whitby	Stock, implements, &c.
Aug. 8	Badminton	Badminton	Stock.
Aug. 7, 8	Staffordshire	Lichfield	Stock, implements, produce, and poultry.
Aug. 2	Northumberland	Berwick-on-Tweed	Stock, implements, and poultry.
Aug. 15	Beamish, Pontop, and Consett.	Gateshead	Stock, implements, dairy produce, poultry, and dogs.
Aug. —	Inverness Farmers' Society.	No meeting for 1883.	Stock, implements, &c.
Aug. —	Lauderdale	Lauderdale	Stock, implements, and poultry.
Aug. 6, 7	Lismore Farming Society	Lismore, County Waterford.	Horses, horned cattle, sheep, and swine.
Aug. —	Herefordshire		Stock, implements, and poultry.
Aug. —	Durham County		Stock, &c.
Aug. 20	Richmondshire	Richmond (York)	Stock, implements, roots, &c.
Aug. 6	Ecclesfield	Hillsboro' Park, Sheffield.	Stock, &c.
Aug. 18	Keighley	Keighley	Do.
Aug. 20	Royal Jersey	Jersey	Stock, implements, &c.
Aug. 25	Halifax and Calderdale	Halifax	Do.
Aug. 28, 29, 30, 31	Royal Dublin	Ball's Bridge, Dublin.	Horses.
Sept. 12	Wigton District	Wigton	Stock, implements, &c.
Sept. —	Vale of Conway	Llanrwst	Stock, implements, dogs, poultry, butter, &c.
Sept. 4	Leominster	Leominster	Stock, &c.
Sept. 4, 5	Warwickshire	Coventry	Stock, flowers, implements, &c.
Sept. 5, 6	Derbyshire (agricultural and horticultural).	Derby	Stock, implements, roots, cheese, butter, poultry, horticultural machinery, &c.
Sept. 5–7	Royal Manchester, Liverpool, and North Lancashire.	Liverpool	Live stock, implements, farm produce, dogs, poultry, &c.
Sept. 12	Northeast Somerset Farmers' Club.	Newton Park, near Bath.	Stock, butter, and cheese.
Sept. 12	Wayland	Watton	Stock, &c.
Sept. 13	Waterford Farming Society.	Waterford	Do.
Sept. 14	Stanhope	Stanhope	Stock and implements.
Sept. 14	Border Union	Kelso	Ram sales.
Sept. 11	Cartmel	Cartmel	Stock, dogs, poultry, crops, &c.
Sept. 14, 15	Cheshire	Crewe	Stock and implements.
Sept. 20	Royal and Central Bucks	Great Marlow	Stock, implements, &c.
Sept. —	Banbury	White Lion Hotel, Banbury.	Roots, ploughing matches, hedge-cutting, draining, &c.
Sept. 26	Royal South Bucks		Farm and garden produce, and ploughing match.
Sept. 26	Frome District	Frome	Cheese, butter, stock, and implements.
Sept. 28	Oswestry District	Oswestry	Stock, implements, butter, cheese, poultry, &c.
Sept. —	Northwest Bucks and adjoining portion of Oxon and Nort Hants.	Buckingham	Cattle, sheep, cart and nag horses, pigs, butter, roots, and ploughing competition.

Agricultural shows held in England during the year 1883, *&c.*—Continued.

Date of show.	Name of society.	Where held.	Nature of meeting.
Sept. 21	Carmarthenshire	Carmarthen	Live stock, &c.
Sept. 12 and 13	Northamptonshire	Kettering	Stock, implements, poultry, &c.
Sept. 18	Alferton Midland	Alferton	Stock, &c.
Sept. 18	North Lonsdale	Ulverston	Do.
Sept. —	East Surrey	Croydon	Field roots.
Sept. —	Bakewell Farmers' Club	Bakewell	Stock, poultry, cheese, butter, wool, &c.
Oct. 17	Chertsey	Chertsey	Roots and ploughing match.
Oct. 25	Ayrshire	Kilmarnock	Cheese.
Oct. 30	Inverness	Inverness	Seed grain, field vegetables, and potatoes.
Oct. —	Surrey	Epsom	Ploughing matches, roots, thatching, &c.
Oct. —	East Surrey	Croydon	Ploughing.
Oct. 9	Tring	Royal Hotel, Tring Station, L. and N. W. Railway.	Roots, dairy stock, sheep, pigs, corn, &c., and local exhibits of implements.
Oct. —	County Kerry		Stock, implements, &c.
Oct. —	Royal East Berks		Ploughing matches, roots, cottage garden produce, and awards to laborers.
Oct.—	British Dairy Farmers' Association.	Agricultural Hall.	Dairy stock and produce, goats, implements, poultry and pigeons.
Oct. 31	Royal Jersey	Jersey	Stock, implements, &c.
Nov. —	King's Royal Root	Great Coggeshall.	Roots and vegetables from seeds supplied by J. K. King.
Nov. 22, 24	Norfolk and Norwich	Norwich	Fat stock, poultry, roots, &c.
Nov. 29, 30	Chippenham	Chippenham	Stock, &c.
Nov. —	Stourbridge Root	No show for 1883.	Roots and vegetables from seeds supplied by Webb & Sons.
Nov. —	Metropolitan Root	No show for 1883.	Roots and vegetables from seeds supplied by James Carter & Co.
	Dumfries Root	No meeting for 1883.	Roots, vegetables, and plants.
Dec. 1–6	Birmingham	Bingley Hall, Birmingham.	Fat stock, implements, poultry, &c.
Dec. 7	Northern Counties	Inverness	Fat stock, poultry, roots, &c.
Dec. 11	Forres and Northern	Forres	Fat stock, implements, poultry, grain, &c.
Dec. 10–14	Smithfield Club	Agricultural Hall, Islington.	Fat stock and implements.
Dec. 13, 14, 15	Canterbury	Canterbury	Fat stock, roots, &c.
Dec. 18	Carmarthenshire	Carmarthen	Fat stock, poultry, dairy produce, sheep, dogs, &c.

CATTLE-BREEDING AND DAIRY FARMING.

THE UNITED KINGDOM.

REPORT BY CONSUL-GENERAL MERRITT, OF LONDON.

THE DEVON.

The leading physical characteristics of the Devon breed of cattle may be concisely described as follows:

> The Devons are comparatively short, but thick and heavy for their height; the carcass is cylindrical, and the skin has a beautiful touch to the hand.
>
> The color is a pure, rich red, with fine silky hair.
>
> The horns have a yellowish, waxy appearance, tapering and gracefully curved upwards and outwards. The head is small and well put on; the muzzle is very fine. The eye is clear, bright, prominent, and shows a good deal of the white round it.
>
> The chest is very wide in proportion to the size of the animal. Legs are short, small, and very fine in the bone, and the animal altogether possesses a very neat and beautiful symmetry.

The Devon of all existing cattle breeds can lay claim to be one which had the greatest reputation for grazing character a century ago, when the Shorthorn, the modern Hereford, the Red Poll, and others had no existence. This is why that breed always stands first in the catalogues of the Smithfield Club and the Bath and West of England Society. The latter was formed in 1777, and the former before the last century closed, when the North Devon was the breed par excellence for small bones, and high quality, just as Bakewell's new Dishley breed was among the sheep tribes.

The history of the Devon can be traced back until lost in obscurity, and Youatt no doubt rightly deems it to be one of the best existing representatives of the original British breed of cattle. In modern times Shorthorns and Herefords have become more popular with rent-paying farmers throughout the Kingdom, generally because they get the larger size and feed to much greater weights. Still they have failed to supplant it in different parts of England, comprising Devon, their native county, parts of Somerset, Cornwall, Dorset, and Hants. In the two last-mentioned counties, where bites of grass are often short, they are better adapted for dairy herds than the Shorthorn, and probably its popularity with rent-paying farmers in the fertile vales of West Somerset is greatly enhanced by the possession of a variety termed the Somerset Devon, which, although not of quite such high quality as the true North Devon, appear to answer the combined purpose of dairying and grazing far better. As a dairy animal the Devon has always been celebrated, not so much for large quantities as for the rich quality of the milk. At the London Dairy Show for 1883, a Devon cow belonging to

Mr. A. C. Skinner, of Bishop's Lydiard, gained second prize in the milking trials, and it was found that there was a greater proportion of solids to its milk than to that of the Jersey and Guernsey cows, which won prizes.

A sufficient reason for their being preferred to Shorthorns in Somerset was recently afforded by a large farmer near Ilminster, accustomed to let as many as one hundred and fifty cows a year to what is termed a "dairyman." He said that the rent paid for his cows was £13 per year, and that his neighbor, who let Shorthorns, could obtain no more. Further, that when barren, although his cows only fed on an average to thirty score pounds weight of carcasses, and the carcasses of his neighbor's Shorthorns averaged thirty-six score pounds, owing to superior quality he was usually enabled to make quite as much money of the lesser weights as his neighbor of the heavier.

It has always been claimed that a Devon yields a larger proportion of roast meat at the best joints than any other beast, and perhaps there is none yielding a smaller proportion of offal to the carcass. In responding to very early maturity it would scarcely compete with the Shorthorn or Hereford. This will be sufficiently seen by investigating the scale of animals exhibited at the Smithfield Club cattle shows. The heaviest in the class under two years old in the display made last December was the one year nine months old steer belonging to the Queen, the live weight of which was 10 cwt., 2 qrs., 10 lbs., whereas the reserve Hereford of Mr. J. F. Hall, only one year, six months, three days old, scaled 12 cwt., 20 lbs. In fact the prize winners in the Hereford class averaged nearly 14 cwt. each, but they were older.

THE HEREFORD.

The Herefords are remarkably good feeders, laying on flesh abundantly in proportion to the amount of food consumed, and their aptitude to fatten is favored by their general placidity of temper. They come early to maturity, whilst the beef is well mottled or marbled, fat and lean, and is highly prized. The prevailing characteristics are as follows:

White face, throat, chest, udder, dewlap, mane, lower part of body and legs, and tip of tail; the other parts of the body red; frequently a small red spot on the eye, and a round red spot in the midst of the white on the throat.

The body is covered with long soft glossy hair, with a tendency to curl. The horns, which are beyond the medium length, are tapering, and have a yellow or white waxy appearance, frequently dark at the ends. Those of the bull spring out straightly from a broad flat forehead, whilst those of the cow or ox usually have a graceful wave with a slight spreading upward tendency. The eye is full.

The chest is expanded, full, and deep, and projecting firmly; the ribs are well-sprung; the back is broad and legs short, indicative of the hardiness of constitution for which these cattle are esteemed; the bone is small, and the offal is light. The Hereford crosses with almost any breed, and imparts an aptitude to fatten.

The Hereford breed is an old race, which can be traced back at least a hundred years. The best herds may, no doubt, be found in its native county, where the white faces are to be found on almost every farm. Shropshire also "swears by them," and they have extended themselves largely into Wales, notably into Glamorganshire, and the border county of Monmouth. Of late years they have made their way much further afield than formerly, and their wealth of flesh would no doubt cause them to be more generally popular if possessed of a higher reputation for dairy purposes. Still the latter faculty can be cultivated, and, strange to say, not only is the cross of a Shorthorn and Hereford a proverbial deep milker, but the slightest dash of the former seems to bring out the latent lactial fertility of the Hereford.

Mr. E. C. Tisdall some few years since published in the British Dairy Farmer Association's Journal a record of the milk yields of sixty of his most famous milkers, and the best of them all was a *cow* called "Old Hereford" which answered to the latter description. Mr. Tisdall supplies the Kensington district at the West End of London with milk and butter, and keeps a large herd of dairy cows.

Herefords have always been deemed better for the dairy in Dorset and Somerset than in their own native county, because probably they are more educated to serve that purpose. The breed has extended into Cornwall, and Mr. Lewis Lloyd has cultivated it in Surrey within six miles of the metropolis. At the last Smithfield show he gained second and third prizes in the class of steers under two years old, one of his animals weighing 14 cwt. 20 pounds when only a day under the two years' limit. There used to be three distinct kinds of Herefords, the mottle-faced, the gray, and the white-faced red, which latter being smaller in bone than the former, has well-nigh everywhere supplanted the other two.

The uprise of the breed in celebrity may be considered contemporaneous with the Smithfield Club shows, which very much promoted it, for Mr. Westear won first prizes for oxen at the first Smithfield show in 1799, and continued to do so at the London shows for twenty years. In fact the Smithfield show record from 1799 to 1834 gives the premiums won by the Herefords as 88, more than double those of any other breed. The Hereford is no doubt an extraordinary grazier, and being likewise of great constitutional vigor and famous for possessing broad, deep, compact forms, there can scarcely be any wonder why it has become so great a favorite in the western prairies of America or in Australia and New Zealand. In a general way the cattle feed to good medium weights—not quite so heavy as some Shorthorns perhaps, but very much more so than the Devon.

THE SHORTHORNS.

The physical characteristics of the Shorthorn breed may be described as follows:

> As the name indicates the horn is short, semicircularly curved, and rather flat. The color of the animals varies from a white to a yellowish tinge of white, some are red, others red and white, and sometimes the white and red are blended, forming a beautiful variegation called "roan," formerly strawberry color. The head is handsome, intelligent, and the expression docile; the eye is bright and full; the ears are thin and fine, well covered with hair; the neck is short, carrying the head gracefully, and springing straight from the back, which is also straight and broad and round. The ribs arch roundly from the backbone; the hips are well covered and not very prominent; the hind quarters are long and full to the tail, which hangs straight and square from the body; the thighs are full and deep and broad; the legs are short and straight, the under line is even; the shoulders are well laid, oblique, and falling well on the body, so as to form a round deep chest with a full swelling bosom; the udder is large and soft, coming well forward, and the teats hang squarely from it. The body is well covered with fine soft hair, and the hide is mellow, with a rich appearance indicating the excellent quality of the beef. Altogether the animal, owing to the evenness with which it lays on its flesh, forms nearly a parallelogram; its strong constitution makes it adaptable to all soils and climates, and its excellencies are so great that its admirers claim for it the title to be placed as the first of our national breeds.

Shorthorns are more generally propagated than any other British breed of cattle, although scarcely known beyond the valley of the Tees before the commencement of the present century. Their original name was *Teeswater* or Durham cattle, and they are still known more as Durham than Shorthorns in many parts of the Continent. At one period there was an apprehension that the Scotch climate would be unsuitable for them, but this has long since been dispelled, they being quite as generally kept in many of the Scotch lowland districts as the native polled cattle, whether Angus or Galloway. They also flourish almost at the Land's End in the contrary direction, as is sufficiently proved by the splendid specimens Messrs. Hoskins & Sons are accustomed to bring from Hayle to the Royal, and Bath, and West of England shows.

After the dispersion of the herds of the Brothers Colling those of the Booths at Studley Warlaby and Killerby came into reputation, together with that of Thomas Bates at Kirklevington, all in North Yorkshire not far distant from the original locality of the breed's first origin But Shorthorns had early popularity in Lincolnshire and Lancashire, and the old red variety of the former county is still famous in some districts for health, good size, and constitutional vigor. The successors of Professor Towneley's Lancashire herd twenty years ago were creditable to that county, and it was close to Lancaster that Mr. Bolton had his famous herd.

At the present day the Duke of Devonshire at Holker eclipses all others so far as the county is concerned, and the Bates men pay a pilgrimage from one end of the Kingdom to the other. The Earl of Latham has a celebrated herd of fashionable Bates cattle at Ormskirk. But it is almost impossible to single out any quarter of the Kingdom where there are not herds of Shorthorns of high reputation, from those of the Earl of Bective, Mr. S. B. Foster, and Mr. Handley, in Cumberland and Westmoreland, to those of Lord Fitzhardinge, Colonel Kingscote, and Mr. St. John Ackers, in Gloucestershire; from Lord Penrhyns, in North Wales, to Mr. Hugh Aylines, in Norfolk. Throughout the Midland dairy districts large Shorthorns are bred, which are deep milkers, and a perfect revolution in Irish cattle has been effected by the agency of the Shorthorn.

Less than half a century since Irish cattle were a by-word and a reproach on account of their big bones, tough hides, and unthrifty character; but now the young cattle that come to the English grazing districts in such large multitudes are well-nigh equal in quality to Shorthorns bred in England, and the big Norfolk and Suffolk graziers are accustomed to depend almost entirely on them for a supply of their raw material, they seldom being accustomed to breed their own. The youngest class of Shorthorns at Smithfield last December scarcely gave such heavy weights as the corresponding Hereford class, the heaviest being the one-year, ten-months and two-weeks' old first prize steer of Mr. Hugh Goringe, weighing 13 cwt., 3 qrs, 4 pounds. The Shorthorns exhibited on that occasion were, however, generally much heavier than the Herefords, Mr. Herbert Leney's third prize six-year old cow scaling 21 cwt., while the Earl of Coventry's giantess eleven-year-old Hereford, which had previously won several royal prizes, scaling 20 cwt., 3 qrs., 2 lbs.

THE LONGHORNS.

The Longhorn cattle may be described as follows:

The horns fully bear out the name of the breed; they grow in such a manner as to be very distinctive; they curve forwards and hang down towards the muzzle, and sometimes actually grow so much inwards as to touch the cheek.

The color is generally dark red, brindled, and pied, with white along the backs. The coat is good and the back straight. The females are very broad in the hips and are good milkers. Many of the cross-bred milch cows in various parts of England show they have a dash of Longhorn blood in them.

There are, however, but few herds of this variety now kept.

It crosses well with other breeds.

The Longhorn breed deserves to be considered next on account of its antiquity, as at the early part of the century more *Longhorns* were kept than probably any other leading breed of cattle, chiefly because it was then considered to be the best dairy breed and was extensively adopted as such in the Midland counties.

It seems singular that the great Bakewell should have prized it so highly, considering that the bones are large and the hides thick of even the better specimens. For deep milking Shorthorns of the right kind excel them, but it has been demonstrated of late that Longhorns can be greatly improved, and highly meritorious specimens have been brought to the showyard by the Duke of Buckingham and several other breeders, chiefly from the Midlands.

The original breed of Longhorns appears to have sprung from Yorkshire, thence to have subsequently receded to Leicestershire, Warwickshire, and Derbyshire in which counties they are now most numerous.

THE NORFOLK AND SUFFOLK POLLED CATTLE.

The breeders of these cattle have determined on the following characteristics, which they should possess:

> The color red. Tip of the tail and udder may be white, and the extension of the white of the udder a few inches along the inside of the flank, or a small white spot or mark on the under part of the belly by the milk veins shall not be held as disqualifying an animal whose sire and dam form part of an established herd of the breed, or answer all other essentials of the standard descriptions.
>
> There shall be no horns, slugs, or abortive horns.

These cattle are known in the counties of Norfolk and Suffolk as the Red Polled. Among the good qualities which they possess is hardiness of constitution, which enables them to thrive on scanty pasturage and to withstand the severe winters and cold springs usually experienced in the eastern counties of England.

Their milking properties are unquestionable, as they have not a tendency to go dry like many other breeds having a reputation as dairy cattle, and it not unfrequently happens that the cow will continue to yield a good quantity of milk from one calving to another.

No doubt the present Polled breed was the result of a cross with the Galloway cattle, large numbers of which were formerly brought into the eastern counties to be grazed. The tuft of hair growing downwards on the forehead is common to both breeds, whilst occasionally a black nose, a "slug" horn, or a spot of white on the face, or, more frequently, on the udder or belly, gives an indication of the original blood.

The breed does not mature early, and is rather diminutive in size. The heaviest specimen at the late Smithfield Club show was Mr. Alfred Taylor's ox, by King Charles, which, within a day of four years-old, scaled 17 cwt., 3 qrs., and 6 lbs., and Mr. R. E. Lofft's eight-year-old cow, which was reserved in the female class, closely approximated to this weight, being 17 cwt., 2 qrs., and 24 lbs.

THE SUSSEX CATTLE.

The Sussex breed was formerly used in place of horses for plowing and heavy work. They were very active and well suited to such purposes; however, of late the working of oxen has decreased in a marked degree, and the breeders of Sussex cattle have turned their attention to the improvement of the animals with great success. They resemble the Devons in many respects, but are larger. Formerly they were not, as a rule, grazed till after they were done with for working, but now they are got to early maturity and produce good beef. In fact, they are so much refined that they are considered by many to approach very closely to the Hereford in wealth for grazing purposes.

At present the breed is restricted very much to the country that gives it name and the two adjoining ones of Kent and Hants.

The cows are not good milkers. They are very hardy, however, and do well on poor pastures. Like the Devons, they are all red, but have larger horns, heads, and bones.

There was an admirable class of Sussex steers under two years at the late Smithfield show. Mr. Dunnett's one year ten months and two weeks second prize one weighed 13 cwt., 2 qrs., and 25 lbs., and one, about a fortnight older, belonging to Mr. H. Page, of Walmer, Kent, weighed 13 cwt. and 3 qrs. The heaviest Sussex ox was that of Mr. S. Clarke, not quite three years and ten months old, which scaled 20 cwt. and 1 qr. The third prize cow, however, belonging to Mr. W. Wood, of Crawley, Sussex, weighed 5 pounds over a ton.

THE SCOTCH POLLED ANGUS OR ABERDEEN.

This breed of cattle is supposed to be descended from what were formerly termed "Angus Doddies," or Aberdeen Hummlies. It is largely represented in Aberdeenshire, Forfarshire, and Kincardineshire, and their leading characteristics may be described as follows:

> Their coat is short, smooth, silky, and glossy, and almost always black, though occasionally some animals have small dull white spots, and still more rarely some are red or brindled. The head is tufted with hair, the ears are rather thick and hairy, the muzzle is somewhat coarse, the legs are well boned, and of moderate length.

Great improvement has been made of late years in this breed by careful selection, and very beautiful animals have been exhibited at both breeding and fat-stock shows.

They are poor milkers, but are very hardy, docile, large, coming early to maturity, and good breeders, and the meat is of excellent quality. In respect of wealth and high quality combined, for grazing purposes they can scarcely be surpassed by any variety whatever, the Scotch graziers appear to think, the only notable preference on their part being for a cross between them and the Shorthorn. Mr. C. Stevenson's first prize three years eight months old steer at the last Smithfield show scaled 21 cwt. and 23 lbs. This was by far the heaviest exhibited. There was, however, a great uniformity of weight between 16 cwt. and 19 cwt.

THE GALLOWAY BREED.

The Galloway breed is much older and quite as highly prized as the Angus in the county of Galloway and many parts of Scotland. They were formerly partly horned and partly polled, but by selection they have now become polled, though occasionally some have small "slugs" or stumps which are not affixed to the skull.

This breed is more hardy than the Angus, and better for dairying purposes, while its claims are also admissible for wealth as a grazer. It is in fact a serviceable all-around tenant farmer's animal. The veteran McCombie, who stood first and foremost among Scotch graziers, wrote as follows in his book on the feeding of cattle:

> I have grazed the pure Aberdeen and Angus, the Aberdeen and North Country crosses, the Highland, the Galloways, and what are termed in Angus the South Country cattle, the Dutch, and the Jutland. If store cattle of the Aberdeen and Angus breeds out of our best herds can be secured, I believe no other breed will pay the grazier more money in the north for the same value of keep.

Mr. McCombie considered that the Galloways "on poor land are unrivaled except perhaps by the small Highlanders," but he did not deem them so easily finished as pure Aberdeens or cross-bred cattle.

The pure Galloway is usually black; the eye is rather dull and sleepy; the ear is thick and very hairy; the back is straight; the head is covered with a semi-spherical knob, tufted with hair; the legs are short and strong."

HIGHLAND CATTLE.

As the name denotes, this breed is native to the West Highlands of Scotland; they were formerly known as North Argyleshire cattle. The characteristics may be described as follows:

Their stature is usually somewhat small. They are clothed with a thick skin, having abundance of long, glossy, and shaggy hair, indicating hardness of constitution in the highest degree. This thick coat is a protection against the atmosphere of winter and from flies in summer. The color varies, some animals being black, others red, dun, yellow, and brindled (red and black). The head is short, and has a profusion of long shaggy and curly hair coming down below the eyes. The muzzle is fine, and the nose slightly turned up.

The eyes are prominent, and have a quick, piercing glance. The horns are wide apart, long, curved, and pointed; the body is straight, thick, very deep, compact, and well formed.

The legs are short and extremely muscular.

They are celebrated for their grazing properties, the meat being of the finest quality, and comes down to the very heels. It commands the highest prices in the principal English markets. For dairy purposes they do not rank so highly, because the milk, though good in quality, is deficient in quantity. They are extremely hardy, vigorous, quick, and active, and capable of enduring both the damp and cold boisterous climate of the Highlands. They thrive admirably on low lands, where they are generally fattened, and are in great demand in England for grazing. Their hardy nature does not require that they should be housed, and they will consume and thrive on coarse pasture, which sheep and many other kinds of cattle would leave untouched.

It is best to graze them for a time before putting them to fat, as they require being gradually accustomed to yards or boxes. Of late years much care and attention has been paid to improving the breed, and frequently handsome animals are exhibited at fat-stock exhibitions; whilst both on their native hills, where their appearance is somewhat wild, and afterwards when being grazed in pastures, their picturesque beauty is always highly appreciated.

The attributes of this breed may be summed up as a combination of great hardiness with splendid quality of meat.

AYRSHIRE CATTLE.

This breed takes its name from the county of Ayr, and possesses the following characteristics:

Their color is usually red or brown and white, in large patches; or all red or brown, and sometimes black and white.

The horns are fine, curve upwards, and are placed on wide apart at their base. The neck is straight from the head towards the top of the shoulders, which are very thin on the top; the back is straight.

The body becomes larger, both in width and depth, as it approaches the hind quarters. The tail is long, fine, and bushy at the end. The legs are short and small in the bone. The eye is mild and the udder very large.

Its origin is not thoroughly known, but for a considerable time breeders have taken pains, by selection and judicious breeding, to increase the properties for which Ayrshire cattle are famous, and which are in a degree indigenous.

These animals are so hardy that they bear almost any variation of climate, thriving well on high-lying districts without losing their milking properties, whilst a milder atmosphere and rich pasturage suit them perfectly.

Their great attribute is their excellent milk, which is good in quality and extraordinarily large in quantity. It is claimed that a cow of this breed will yield as much milk for food consumed as any member of the bovine species.

Ayrshire cows are very popular in their native county and throughout the dairying districts of Scotland, partly because they suit the systems of farming adopted much better than heavier cows, such as Shorthorns, would do, for the feeding is very much restricted to the arable portion of the farm, the land being kept down to artificial grasses two years that dairy cows may be kept. The chief objection against Ayrshires in England is that when the cow has ceased milking it is worth very little for grazing purposes.

JERSEYS AND GUERNSEYS.

The same objection as the foregoing applies in a still greater degree to the Jersey. Still there are pastures with short bites in the south of England for which Jersey herds are adopted even by tenant farmers. As a fancy animal for noblemen's parks, and to adorn the grounds of our country gentry, Jerseys are very much extending themselves everywhere. They are not only affluent milkers, but the proportion of cream to milk is large, and the yields of butter realized from some are remarkable. A great many good herds are to be found in Hants, and indeed all along the southwestern coast, also in Essex and the home counties.

The Jersey cow is too well known for its neatness of form, slender frame, its deer-like head, and its gentleness to require further description.

The cows of the sister isle, Guernsey, are celebrated for yielding more butter than even Jerseys. They are also larger in size and more hardy, still they seldom yield carcasses to the satisfaction of English renting farmers after their milking season is over. The same parts of the Kingdom where Jerseys are found most numerous patronize the yellow Channel Islands breed.

The best English show-yard herds of Guernseys are probably from Hants and Devon. In propagation the Guernsey in England seems naturally to develop into more grazing character, and detract somewhat from fine quality, or at least what would be considered so in the eyes of an island judge.

Jerseys and Guernseys were for a long time accepted in England under the general title of "Alderneys," the probability being that they were first introduced from the island of that name. It is only lately that the difference existing between them has become generally known.

In both islands the entry of foreign stock for breeding purposes is prohibited. The law enforcing this has been long in existence, and most rigidly observed; this accounts for the purity of the breeds in these islands.

The animals are narrow between the shoulders, have short smooth coats, and the eyes have a mild, docile expression. They are healthy, breed well, and last long. The principal malady to which they are subject is milk fever, which, if prompt measures are not taken, proves a sure destroyer.

WELSH CATTLE.

The Welsh Runts, as they are sometimes called, may be considered as an aboriginal breed, but they have been found to vary very much in quality. This arose from sufficient care not having been taken formerly in selecting them for breeding.

They are apt to be somewhat ragged in outline, though fairly good specimens are occasionally found, especially of late, as more attention has been given to form and quality.

They may be denominated a middle-horned breed, rather inclined to long. The horns are wide-spreading, white, tipped with black, and curling upwards.

The color of the animal is usually black, and some have a little white.

They are good for dairy purposes, but are usually too strong in bone and hide for grazing profitably. Still, in the hands of a few leading breeders, they have become so much refined of their coarseness that they begin to make an impression at the Smithfield Club show, and last December Mr. Owen Thomas, of Anglesey, could claim to have the heaviest animal in the show with his nearly four years old ox, which weighed 22 cwt., 1 qr., 6 lbs.

The Welsh Cattle-Book, published in 1874, gives the characteristics of this breed most fully.

KERRY CATTLE.

The Kerry is the only native Irish breed worthy of mention. The cows are good milkers for their size; from the ease with which they are kept in a limited space they are often called the poor man's cow. They are small, handsome, and very docile; the head is fine and small, the eye quick and animated. Frequently the animals do not exceed 40 inches in height.

The foregoing succinct and detailed references to the various breeds of cattle furnish general descriptions that may be unreservedly accepted, the printed notes being those made by the current president of the Royal Agricultural Society of England, Sir Brandreth Gibbs, who has had forty years' official connection with the Royal Society and the Smithfield Club, whilst the written account has been specially compiled for me by Mr. Joseph Darby, an author of works on cattle, sheep, and dairy subjects, well known and esteemed in this country.

Herewith I inclose the various items of information which I have obtained in response to letters addressed to several of the leading stockowners of the British Islands, and from personal visits made by myself, especially in Essex and Norfolk. I shall, however, wish to make the following preliminary remarks on the whole subject:

SELECTION OF FOREIGN CATTLE FOR THE UNITED STATES.

In reference to the assertion that there are only ten or eleven breeds of cattle in the United States, where there is room for at least thirty, and that England possesses twenty breeds and France fifteen breeds and other European countries in like proportion, I would observe that whilst doubtless some additional breeds to those at present in the United States may be advantageously introduced, yet the cattle now in the United States are selections from the best breeds of Europe, where stockbreeders are reducing the number of their breeds, so that those best suited for the production of meat and milk are crowding out the inferior breeds very rapidly. Thus the restriction of breeds to small numbers infers the "survival of the fittest," and is indicative rather of agricultural progress than the reverse. For the future it may be forecast that the European breeds of cattle, sheep, and pigs will notably diminish in numbers and correspondingly improve in value.

The paragraph referring to imported breeds producing in their new homes, when suitably located and managed, offspring superior to that produced in their original homes can only be accepted with reserve, as although numerous instances of great breeding successes are established in the records of the United States, that result maybe attributed to the fact of the imported cattle and pigs being generally picked specimens, selected for their excellence, whereby their progeny are put out of comparison with the more ordinary stock from which specimens are commonly seen at the shows of the United Kingdom.

I am advised by eminent authorities that however grand may be the American results attained in the case of Jersey cattle &c., yet it is thought to be advisable to replenish stock by returning to the original homes of the breeds, whilst I note also in a report relative to Shorthorns from our consul at Leeds, that buyers are recommended to revisit the Teeswater districts, where the grand old Durham stock, renowned for its size, good constitution, and splendid milk-bag, exists in large numbers, and from which the refined, improved Shorthorn has been carefully bred.

So also in respect to French breeds I feel assured there is a wide scope for importation of superior cattle from their native districts, from which, the best specimens being selected, it may be expected the American continent will soon produce a higher general level of excellence in such new breeds than could be found in France. Besides the Norman, Brittany, Flemish, and Charolaise breeds, there are quite half a dozen French breeds of cattle which probably might be advantageously introduced into the United States.

Your attention is called to inclosure "Notes on French Live Stock," from the official French catalogues of the Paris Exhibition of 1878, with illustrations added which do not appear in the original catalogues; also to the critical report of the last Paris cattle-show (February, 1883), written by Mr. Kains-Jackson and published in the London Times and the Field (inclosure 2),* which gives the most complete description ever published here.

PUBLICATIONS CONCERNING BRITISH CATTLE.

The detailed information sought as to the costs and methods of exportation, the critical descriptions of the several breeds, their relative numbers and relative production for meat or milk would require, even in a most condensed form, a volume of several hundred pages. Such a work would not be difficult to compile from existing materials and from the special supplementary details now obtained, especially as in recent years great activity has been shown in Great Britain and Ireland in supplying authentic matter for the compilation of stud and herd books.

The Suffolk Stud-Book, the Carthorse Stud-Book, and the Jersey Herd-Book have lately appeared, and now the Devon Herd-Book, the Cleveland Bay Stud-Book, the Hackney Stud-Book, the Pig-Breeder's Stud-Book, and other similar works are in course of preparation.

The Shorthorn, Hereford, Scotch, Polled, Red Polled Ayrshire, and Welsh Black Cattle Herd-Books have been established for several years, and each of these may be readily obtained, and should be consulted as affording the most valuable information extant on the various subjects. Careful illustrations of the various breeds, critical notes on their standard points in these works convey a correct knowledge of the animals, and nearly all the written information that individual reports may contain will have been in most cases drawn from the sources above indicated.

---

*See Supplement.

Herewith I forward (inclosure 3) a useful small dictionary volume, by the Rev. Holt Beever of the several tribes of Shorthorns. I also forward as a most successful work (inclosure 4) a large folio volume on the Cattle of Great Britain, containing several illustrations and with descriptions written by authors selected for their knowledge of the subjects; and also a volume (inclosure 5) entitled "The History of Polled Aderdeen or Angus Cattle," by Messrs. James Macdonald and James Sinclair, which is a valuable and most complete work, exhaustive of the subject.

In the volumes of the Royal Agricultural Society of England, since 1840, are found the Prize County Histories of the country, in which are given an account of the geological subsoil, the surface soil, rotation of crops, pastures, elevation and aspect of the land, of breeds of stock and methods of feeding and rearing them. Such histories were written in response to prizes offered by the Royal Society.

The Farmers' Hand-Book (inclosure 6) herewith forwarded contains notes on the Royal Society, the Smithfield Club, and various other leading societies. Here may be observed that the several prize lists of the great agricultural shows give the names and addresses of the chief stock-breeders in the country, although exceptionally some of the most renowned breeders do not exhibit, as their stock enjoys celebrity for its excellence that commands the highest prices at home and abroad.

PRIZE VS. ORDINARY STOCK.

In the matter of prize cattle, whether for size, weight, quality of flesh, milk, wool, smallness of offal, &c., it is well to remember they are always exceptionally chosen animals, reared and fed under favorable circumstances, and are not representatives of the total number of farmers' stock which is not usually of a pedigree character. For this reason the weight of meat, or the quantity given of milk, have to be regarded simply as instances of special rather than of general excellence. Still, I may make comment that the differences between prize results and ordinary results are not enough to induce the ordinary farmer or dairyman to purchase stock at fancy prices; and the same argument applies to purchases from abroad. However, when the object is to establish herds or flocks of repute, only pedigree stock should be bought.

GEOLOGICAL CHARACTER OF THE BRITISH ISLES.

The geological character of the British islands, their insular climate, and the small altitude of the land are best described in special works on the subjects, and agriculturists afford but little information. The upland pastures and what are called mountain districts are inconsiderable in comparison with the lowland grazing districts, valleys, and marsh lands of only 50 to 500 feet above sea-level; and of Great Britain generally it may be said that the various breeds of stock may be changed from district to district without losing their character. Shorthorns thrive everywhere, yet the north of England well holds its character as the home of the race. Devons fattened in Norfolk often surpass those fed in their native county, and Cotswold sheep also thrive in various counties. Southdowns, Oxfordshire downs, and in fact nearly all the breeds of stock in the British Islands allow of interchange, district with district, without losing their character; from which the fact may be inferred that the diversities of altitude and climate are insufficient to affect stock materially in Great Britain.

THE SANDRINGHAM HERDS.

The inclosure 7 is a return with which Mr. Samuel Beck, agent to the Prince of Wales, favored me. It will be observed that all the stock are managed, pedigree Shorthorns, Alderneys, Black Polls, and other cattle, in a manner that a tenant farmer might profitably follow. Of this I had the opportunity of assuring myself by a visit of inspection which I made in the middle of the present month, devoting several hours to a survey of the farms, their buildings, stock and general character, and being favored with personal explanations from Mr. Beck, and from his son, Mr. Frank Beck, whose minute acquaintance with every agricultural detail was of the greatest advantage to me. The parade of the pedigree stock in the several exercise-yards, and the groups grazing in the open pastures formed a "royal show" in private of the most interesting character, being free from the turmoil and crowded surroundings under which stock are commonly seen at agricultural shows.

The herds of Shorthorns, at Sandringham, are located upon two distinct farms at Babingley and at Wolferton, 2 miles apart. The one herd of the "Bates and Knightly" blood is kept separate from the herd of the "Booth" blood, and admirers of either have thus an easy opportunity of noting the respective points.

Some years ago the following words were written by a competent critic of Norfolk farming:

> It is nothing but a plain truth to say that Norfolk farmers needed a sound lead to follow in the matter of live-stock management, and there is one to be found at Sandringham, thanks to the management of the Prince of Wales.

The bulls of the Wolferton herd include the Admiral, Baron Wolferton, Beauchamp, Denmark, Dereham, Downham, Dunkirk, Fortis, Fraternas, Gamester, Marias, Ponsapo, Pluto, Royston, Samson, and Viscount. Their ages are from twelve months to six years. Amongst the cows are fifteen Diadems, the offspring of Mr. Fisher's bull (Fawsley Prince, 31,150, and Diamond, by the Chieftain, 20,942). Amongst the Babingley herd is the bull Babingley Duke, 42,680, with the best of Mr. Bates's blood. Through all the mazes of the Wild Eyes family, dam Blythesome Eyes, sire Marquis of Oxford 2d, 37,055, the bull Duke of Norfolk, calved June 13, 1880, and bred at Sandringham, is by the Earl of Bective's Duke of Underly 3d, 38,196, and Fuchsia of Hilhurst.

Considering the size of the farms, their carrying a pedigree herd of about 30 bulls and 80 cows, besides numerous store-stock of Devons, Black Polls, Highlanders, and dairy cows, they bear witnesses to economy of management and productive capabilities which are astonishing in an estate that was "nowhere" twenty-five years ago, and which has since 1863 been made into a most picturesque domain and fertile land. Even the miles of evergreen trees, mostly Scotch firs, giving Sandringham a moorish appearance, were planted by Mr. Beck, and in the very hot season of 1868.

The farm buildings were mostly the old farm structures, merely kept in good repair, and here and there improved by economical additions.

I saw no costly outlay anywhere, neither in barns, sheds, stables, or fences at Sandringham.

Many of the animals of the Prince of Wales's herd are obtainable at fixed prices that are so moderate that any farmer may invest in them, and, compared with the prices asked in similar first-class herds, it is evident that Sandringham, as a source of good Shorthorn blood, is meant to be a fertilizing stream for farmers at home and abroad. The "Diadem" strain is a valuable one for its milking qualities, some of the cows giving two gallons when out on grass. The herd of cows out in the open Wolferton marshes were looking, on the 17th of January, all in healthy condition, noticeably so considering the slight attack from foot and mouth disease from which all had suffered. The Babingley herd, only 2 miles distant, had entirely escaped. The hardihood and general condition of both herds witnessed to the good stamina of the stock, and whilst the Babingley farm is in soil, situation, and general character only a good average one, the Wolferton low levels, wind-swept and marsh-musty, are as exposed and cold as can be any quarters to which the stock are likely to be moved.

The Sandringham Shorthorn herds represent the best of the blood in the kingdom. Its stock is drawn from the herds of the Duke of Manchester, the Earls of Dunmore, Feversham, Bective, of Lord Fitzhardinge, of Colonel Kingscote, and of Messrs. Bowly, Darling, Hamer, Samuda, Sartoris and Tracey, as representing the Bates blood; whilst the Booth blood is represented by the herds of Her Majesty the Queen, the Rev. J. N. Micklethians, and Messrs. Hugh Aylmer, H. D. Barclay, A. H. Browne and J. Gamble.

The pastures are often of that good grazing character called "bullock-pastures" of the old mixed grasses and adapted to fattening stock. In this direction the Prince of Wales has often been successful, and there are now in the yards some Devon, cross-bred Black Polls, and two Highland cattle that may be expected, in 1884, to be in the front rank at fat stock shows.

From the responses to my circulars requesting information I extract the following:

THE DUFFRYN HERD OF SHORTHORNS.

Mr. R. Stratton writes relative to his "Duffryn Herd of Shorthorns" (inclosure 8):

History of the Stratton herd.—My herd was founded by my father in 1837, by the purchase of Phœnix (6,290), which had been bred by Mr. Bellamy from the stock of C. Colling, and was the sire of Moss Rose, calved in 1838, whose progeny may be said to have made the reputation the Stratton Shorthorns may claim. It has been computed that they have won not less than £10,000 in prizes. The dam of Moss Rose was a cow of good Shorthorn character and an excellent milker. She was purchased in the market and her pedigree was unknown. The herd has always been managed with a view to produce stock combining good milking and feeding qualities; with what success the records of the Smithfield Club, the London Dairy Show, the Dairy Classes of the Royal Agricultural Shows attest. At the Smithfield shows they have won more champion prizes than all other Shorthorn tribes put together.

In my father's time the herd was kept for many years on the Wiltshire Hills; my brother's herd at Alton Priors was also kept at a very considerable elevation, some 700 feet above the sea, and proved remarkably hardy. They have always been bred with a view to hardihood, and many of the heifers and late calving cows have invariably been kept in the open fields all through the winter with only straw or rough hay besides the grass of the pasture to eat. These Shorthorns are as hardy as any domestic breed, and when Shorthorns have been objected to,on the ground of delicacy, they have become so from the system of "in-and-in breeding" largely practiced by breeders in this country.

My herd is now, for the most part, kept at the Duffryn, Newport, Monmouthshire, where the soil varies from gravel to old red sandstone. The cattle do well on either. Heifers are generally brought to calve at about thirty-three months; bull calves are generally allowed to suck their dams, whilst heifer calves are taken from the cows and reared with only a little milk, as it is considered that too generous feeding is injurious to the milking qualities.

Milking qualities.—I can give no details as to the annual yield in milk per cow per annum, having never kept any record, but Sir H. H. Hassey Vivian, Bart., M. P., has two cows of "Stratton" blood that have given over 1,000 gallons of milk within the year.

Size and weight.—As to size, two of my biggest cows, in good, fair condition, I find to measure as follows: Chloe, girth, 7 feet 4 inches; length, 7 feet 5 inches; Heather, girth, 7 feet 5 inches; length, 7 feet 7 inches.

I have had a heifer increase as much as 672 pounds in twelve months.

As to relative live and dead weight, two of my champion Smithfield heifers have been as follows: Icicle, alive, 19 cwt., 9 pounds; dead, 1,674 pounds. Wild Flower, alive, 17 cwt., 2 quarters, 9 pounds; dead, 1,420 pounds.

I do not consider the cows fully matured until six years old.

Shorthorn crosses.—Shorthorns are far superior to all other breeds for crossing purposes, and it is a notable fact that two or three crosses of good, pure blood upon any inferior nondescript stock will often stamp the progeny as pure-bred Shorthorns, and, for all intents and purposes, they are in no way inferior.

The champion shorthorns of Smithfield for many years past have none of them been eligible to the Herd-Book, though all by pure-bred bulls; thus illustrating their efficiency in crossing purposes.

RESPONSES FROM VARIOUS QUARTERS.

A note from Sir John B. Lawes, Bart., from Rothamsted, Herts, refers to the district as one chiefly devoted to corn growing, and having no special breed of cattle or sheep. (Inclosure 9.)

I may here observe that in recent years Sir John has laid down many acres of his estate in grass, and that in the neighborhood a considerable herd of stock, cattle and sheep, of diverse breeds, is kept, maintaining the special characteristics of the districts from which they have been changed.

Somerset Devons.—Mr. T. H. Risdon, of Somerset (inclosure 10), forwards a valuable condensation of information as to Somerset Devon cattle:

> At Washford the mean temperature is 50°. It is as high as 66° in the summer and the winter mean is not below 34°.
>
> The girth of Mr. Risdon's Devon cows is 7 feet 6 inches; of bulls, 7 feet 6 to 8 inches, thus competing with Shorthorns, except that the latter have greater length.
>
> The average yield of milk is 1,800 quarts including time of suckling. The breed is regarded as native to the soil and pure blood has been recorded for over one hundred years. By interchange of sires in-and-in breeding is avoided as much as possible. Store-stock are housed, January to April, inclusive. The cattle are fattened in watered meadows on grass grown after hay-making until the end of October, when they are housed in covered pens. The breed are bred and reared on much higher altitudes, with corresponding lower temperature, than at Mr. Risdon's homestead.
>
> The average live weight is from 13 cwt. for cow to 17 cwt. for bull.

Shorthorn Gwynns.—The report from Bedford (inclosure 11) from Messrs. J. and F. Howard, quotes Shorthorns (Gwynn tribe) as mature at 3 years. Their live weight averages from 14 to 16 cwt. The live weight of fat stock is, for the cow, 18 cwt.; bull, 23 to 26 cwt.; ox, 16 to 18 cwt. From the milk, 16 quarts daily; the week's butter is 8 pounds.

Norfolk Red Polls.—From Stanton, near Harleston, Norfolk, I was favored with a report from Mr. Alfred Taylor (inclosure 12), whose herd of Red-Polled cattle is typical and of high excellence. The farm in South Norfolk is 114 feet above sea level, upon a clay and gravel subsoil, and the pasturage is of permanent grass, or of clover and rye grass sown with arable rotation. Accessible shelter is provided in winter adjoining the meadows on which the cows are pastured. Mr. Taylor considers he can keep three Red-Polled cattle where only two Shorthorns would find sufficient food, and having kept both breeds at the same time and on the same farm he bases his opinion on experience.

The constitution of the Red Polls is very hardy. Fat steers from two and one-half to three years old weigh 60 stone, and upwards (840 pounds), when fed in the ordinary way on roots, hay, and cake. This is the dead weight of ordinary fat stock; and such as are "ripened" for the Christmas shows have weighed 1,164 pounds (see page 7 of inclosed pamphlet).

The meat of the Red-Polled cattle is excellent, and has a larger proportion of lean when compared with some other breeds.

Mr. Taylor, in referring to the several particulars given in the above pamphlet, accepts them as correct statements, and I may add that the writer is well recognized as a competent critic of the Red-Polled cattle, and is the editor of its Herd-Book.

The popularity of this breed has rapidly increased in its own district and abroad, so much so that breeders are restricting their sales in order to obtain sufficient numbers at home.

The Lofft-Suffolk Red Polls.—The herd of Red Polls belonging to Mr. Lofft of Troston, near Bury St. Edmunds, Suffolk, is of great repute, and gave its owner the confidence to challenge the breeders of Scotch Black Polls to show a group of five animals in competition with five Red Polls. However, the comparison has not yet been publicly made, and the five "Doddies" shown by Mr. McCombie at Paris, in 1878, are still recognized as the best group ever exhibited. The farm of Mr. Lofft is 40 to 70 feet above sea level, and the range of temperature in 1883 was 48.6 degrees, the rainfall 26.19 inches. The soil is a mixed drift, very unequally distributed on a chalky subsoil, or drift clay, sand, and gravel. Old meadows, varying greatly in different seasons from the natural pasturage, and artificial pasturage of clover, sainfoin, and rye grass is made, principally for horse and cattle keep. Mr. Lofft has also used largely *gorse* for horses and cattle, and gives his stock in small quantities chicory, Jerusalem artichokes, prickly comfrey, &c.

The cow stock are taken in at night as soon as white frosts begin to appear in autumn, and are tied up in a large and lofty barn, but during the day are turned out to graze, or for air and exercise only, in a large yard, according to circumstances. In summer, from May to October, they are fed on the pastures continuously, sometimes helped with cheap or abundant food like cabbage, turnips, swedes, or two to three pounds of cake. The winter feeding is swedes, turnips, cabbages, cake, barley, or other meal, malt grains, and hay or straw chaff. Mr. Lofft is breeding three sorts of Red Polls; first, large growthy beef-makers; second, middle-sized general-purpose animals, milk and beef; third, a small size for milk only.

Heifers commence to breed from fourteen months, and line-breeding is approved by Mr. Lofft, except when special objection exists. The difference in weights are as follows: Large size: Bull, 1 ton to 1 ton 7 cwt.; cow, 15 cwt. to 17 cwt.; steer, 12 cwt. to 13 cwt., 2 years old. Middle size: Bull, 18 cwt. to 1 ton; cow, 13 cwt. to 14 cwt.; steer, 10 cwt. to 12 cwt., 2 years old.

Mr. Lofft looks to form a small dairy Red-Poll tribe of less size than either the Kerry or Breton stock, but has only bred with these aims for a couple of years. The remarks of Mr. Lofft on milking qualities in cows deserve attention.

The origin of the Red Polls is a debatable point, and therefore it is important that Mr. Lofft distinctly states "the root of the race is the old Suffolk cow." About the time of the first French revolution High Suffolk was noted for its herds of dun cows, pale yellow, or slightly ginger color. This cow, Mr. Lofft believes, is a variety of the old White-Polled cow indigenous to the country, and kept, in bygone times, either tame by the monks or semi-domesticated in noblemen's parks. He intends to get up two small herd of these old and very scarce stock, famous for their milking qualities.

The Herefords.—In reply to my inquiries, Mr. T. Duckham, M. P., who, as first editor of the Hereford Herd-Book and representative and resident in the county, is generally associated with its celebrated cattle, gives his authority to the belief that they are "indigenous" (inclosure 13). He also refers to the records of Smithfield for comparison of the Hereford breed with other sorts.

I may here note that whilst staying at King's Lynn, Norfolk, after my visit to the farms of the Prince of Wales, I found the picture of a Hereford ox on the walls of the hotel. This animal was exhibited in 1844, and was bred in Norfolk by Mr. Hudson, of Castle-Acre. The weight was 1,948 pounds, the carcass weighing 1,740 pounds, and the fat 208 pounds. The dead weight of the world-renowned Durham ox was 2,322 pounds.

The Morland Sussex.—Mr. W. C. Morland, of Lamberhurst Court Lodge, Kent, in reference to the Sussex breed of cattle (inclosure 14), gives their weight at three years—cow, 80 to 85 stone; bull, 100 to 190 stone, the stone being 14 pounds. In this, as in other cases, the recorded weights at Smithfield furnish the best comparison between the various breeds.

The Sussex stock are notably a heavy, beef-making breed. It is a point to be remembered that the cattle are housed in winter, not on account of delicacy of constitution, but because of the wetness and coldness of Wealden soil, a geological special clay.

The Sussex breed are believed by many stock exhibitors to have been derived from the Devon breed, but for a long date they have been native to Sussex, where they are favorites.

The opinion of Mr. John Treadwell, Upper Winchenden, Aylesbury, Bucks, is regarded as second to none in the matter of stock. Mr. Treadwell's leisure is entirely taken up by judging at the Royal Society and other shows. This farm of 270 arable and 330 of pasture acres is visited by agriculturists from all parts. In his report (inclosure 15) he states that his herd of Shorthorn grade milch-cows average 16 pints of milk each per day.

The North Devons.—An unsigned return (inclosure 16) from North Devon speaks in favor of the North Devon breed of cattle for local breeding and feeding, and gives a very moderate estimate of weight at maturity—cow, 6 to 8 cwt.; bull, 10 to 12 cwt.; ox, 8 to 10 cwt.—which seems to fit with the appellation given to North Devons, "the little noblemen of the hills."

The inclosure herewith sent (No. 17), relating to Smithfield, gives the names of prize breeders for several years, and these names form a directory of great value to buyers.

THE ABBEY FARMS HERD OF SHORTHORNS.

Among the noted herds I was fortunate in being able to pay a visit to the stock farms of Mr. Hugh Aylmer, West Dereham. I arrived at the well-known "Abbey Farm" unexpectedly, and found Mr. Aylmer was "amongst his stock in the fields." I soon had the pleasure of making the acquaintance of one of the most successful breeders of Shorthorns now living, and whose name with that of Mr. Booth is connected wherever the celebrated blood is found. The inclosure (No. 18) is the current catalogue of Mr. Aylmer's stock, to which reference will show the unrivaled character of the stock.

The homestead, near the remains of the old abbey, is situated in a rich, level country, some of the pastures carrying one and a half bullock to the acre.

On two out of the three farms occupied by Mr. Aylmer there had been a slight attack of foot-and-mouth disease (a terrible scourge, where animals worth 500 guineas each are exposed), which had been successfully treated and routed.

At Dereham we were on classic rural ground, for Tusser, the agricultural-axiom author, occupied the moated farm where the abbey remains.

Having visited the plain, useful farm buildings, all fairly ventilated, and seen the first group of a dozen pedigree cows all out for day grazing, during the present very open season, we went to the manor-house farm, passing the flock of Cotswold shearling ewes, fenced in with inexpensive string-netting tied to sticks. In the cattle stables each manger had three divisions, one for sliced roots, one for broken cake, and one for a lump of rock-salt. The latter was everywhere, in buildings and fields, always accessible.

On this farm, amongst the stock that I especially noted were young Sir Anthony, a red-and-white bull, calved last March; Stopford, just twelve months old, son of the Sir Simeon which has just been sold at a large price to go to Ireland. Stopford promises to become as grand as his sire. There were also a couple of heifers—Castanet 10 and Castanet 11—bred from that capital bull Sir Benedict, 42388, a splendid white roan. These two Castanets, half sisters and about a year old, are considered worth 1,000 guineas the pair.

The bull Felix, rather over two years, was a very handsome and complete roan, and goes back to Comet, an illustrious descent. King Roderick and, indeed, most of Mr. Aylmer's stock, have noticeably flat oval-shaped horns. Some of the grand old cows we were looking at had produced ten to a dozen calves, selling at from 350 to 400 guineas each. One young bull-calf we saw, under twelve months old, is priced at 350 guineas.

The repute of Mr. Aylmer's stock is such that for twenty-five years there has been no occasion to exhibit at shows. Some of the cows, I noted, had twice calved in the twelve months—a good evidence of their prolific nature.

In Mr. Aylmer's "workshop," or study, was the framed certificate awarded him at the Centennial Exhibition held at Philadelphia in 1876, where he exhibited a pen of his sheep.

DENCHFIELD STOCK.

From the celebrated vale of Aylesbury Mr. Edw. Denchfield gives some useful details of Buckinghamshire as to its famous regions (inclosure 19).

Plaster clay is the geological strata southeast, between the Thames and river Colne. Then there is the chalk formation of the Chiltern Hills, and the Tesworth clay fills up the vale of Aylesbury, noted for its productions both animal and vegetable. Limestone and oolite occupy the north of the county, and the natural grasses of Buckinghamshire favor the finishing off as well as the rearing of stock. Dairy herds of Shorthorns flourish here, whilst the summer meadows are good enough to graze and fatten bullocks.

Yards and stalls are afforded to house the cattle in winter, but some of the stock remain out all the year round. The stock thrive on the grasses in summer and get hay, straw, roots, and artificial food in winter when needed. The cattle are bred in the dairy herds and weaned at first on milk or artificial substitutes. The heifer calves are brought on to replenish the herds, and the young bull calves are either sold as stock bulls, or as oxen are drafted into other counties of tillage land, to be fed out.

Mr. Denchfield adds that he finds Shorthorn cattle best for dairying purposes, since they come to heavy weight for the butchers when fed out. The yield of milk and butter varies much with the seasons, so that the last decade of wet years has lowered the average before established.

I may here observe that some of the very best stock of all kinds, horses, cattle, sheep, and pigs, come out of the county of Bucks, and with such good stock the name of Denchfield has been associated for many years.

COTSWOLD CATTLE.

From Colonel Nigel Kingscote, M. P., I may conclude the special references. In the Shorthorn Herd-Book Colonel Kingscote, at the present time as in the past, will be seen to own some highly celebrated stock. His estate, Wotten-under-Edge, Gloucestershire, is 800 feet above sea-level, on the west of the Cotswold hills. The geological stratum is oolite, and here, on a brash loamy surface soil, the pure-bred Shorthorn cattle, the pure-bred Sussex Southdown sheep, the pure-bred Suffolk cart-horses, and the pure-bred Berkshire pigs form a higher class stock that I note in evidence of the adaptability of diverse English breeds to a "habitat," thus is, in each instance, a change to their original districts, but where they all flourish and attain a high degree of excellence.

The cattle are housed in winter, in covered yards and open sheds, and fed on hay, straw, and roots. They reach the weight of 18 cwt. and upwards, and are disposed of by private and public sale.

WEIGHTS OF THE VARIOUS BREEDS.

The comparison of cattle breeds, in the report made by Mr. Faulkner, whose figures are valuable, brings together the following points, as averages in pounds (embraced in Consul Dockery's report):

Live weights, under four years old.

Breed.	Steer.	Heifer.	Cow.
Welsh	2, 498	2, 214	2, 214
Herefords	2, 486	2, 127	2, 320
Polled Aberdeen	2, 375	1, 883	1, 883
Sussex	2, 241	1, 890	2, 245
Shorthorns	2, 212	2, 049	2, 352
Highlander	2, 092	1, 486	1, 486
Norfolk Polled	2, 012	1, 984	1, 984
Devons	1, 966	1, 600	1, 934
Jersey	896	....	....

Dead weight, average in pounds.

Shorthorns	920	800	800
Sussex	840	720	800
Longhorns	800	920	800
Polled Aberdeen	720	....	....
Polled Norfolk	700	....	....
Ayrshire	....	....	560

Offal reckoned 8 pounds to the score, except in regard to Welsh, of which the offal is estimated 9 pounds to the score.

Amongst records of extraordinary weight are three instances, these being of a Durham ox, a Hereford animal, and a Norman, the latter being exhibited as the "bœuf gras" in Paris.

The dead weight of the Durham ox that was exhibited throughout England, in a former generation, was 2,322 pounds; of the Hereford ox, 1884, bred in Norfolk, 1,938 pounds; and the Norman bullock, alive, weighed over 30 cwt.

MILK AND BUTTER YIELD OF THE VARIOUS BREEDS.

The average weight of milk thus compares yearly:

Breed.	Pounds.	Pounds of milk to 1 pound of butter.	Pounds of milk to 1 pound of cheese.
Shorthorns	8,000	24	10
Herefords	3,000	....	....
Devons	3,500	22	9
Polled Aberdeens	3,500	24	10
Galloway	3,000	22	9
Polled N. (see printed notes forwarded)	....	....	....
Highlander	2,750	22	9
Sussex	4,000	24	11
Welsh	3,000	24	10
Longhorns	3,000	22	9
Ayrshire	6,000	22	9
Jerseys	4,880	17 to 20	....

In a recent instance the Devon cow Myrtle gave 26 pounds of milk in a day at the London Dairy Show, and the solids of her milk were found superior to that from the Jersey competitors. The Polled Norfolk cows have also given some large milk records, and extending over a long period.

Mr. Faulkner's opinion is in agreement with that of most other experts when he indicates the best beef-producing animal as the cross bred from the Scotch Polled cow and Shorthorn bull. Still, of late, this superiority has been challenged by breeders of Hereford and other crosses.

PRICES OF THE VARIOUS BREEDS.

The general prices of pedigree animals are closely appraised for cows and heifers:

Breed.	Price.		Breed.	Price.	
Shorthorns	£35 to	£50	Hereford	£35 to	£50
Devons	30	45	Galloway	25	40
Aberdeens	30	45	Ayrshire	20	35
Sussex	30	40	Norfolk	30	40
Jersey	20	30	Welsh	20	30

The prices at which stock was sold during the year 1883 at the Birmingham Show sale were as follws:

Shorthorns.—One bull 200 guineas and one for 50 guineas; one heifer brought 37 guineas, and one of "Factory Girl strain" 82 guineas. The prices of others sold ranged between the last two prices named.

Sir Hugh Aylmer's sales of Shorthorns took place at the Manor House, West Durham, on the 3d of May. It was well attended, but prices were not so high as many anticipated. Fifty-five cows brought £3,798 18*s.* 6*d.*, averaging £69 1*s.* 5*d.* each. Eighteen bulls sold for £1,038 6*s.*, or an average of £72 13*s.* 8*d.* The highest price paid was for Eastthorp Lady 2d, calved May 14, 1881, 200 guineas. The celebrated bull Sir Simeon was passed, the reserve of 500 guineas not having been bid.

On July 11, at T. Halford's sale of Shorthorns at Castle Hill, Sherbone, four cows and three bulls brought on an average £745 10*s.* each. The highest figure, paid by Lord Bective for the Duchess of Leicester, was 1,505 guineas. Thirty-two cows averaged £185 7*d.* each, and six bulls averaged £281 18*s.* 6*d.* each.

At Henry Lovatt's sale, July 3, at Low Hill, Wolverhampton, the average obtained was £53 2*s.* 2*d.*

The great Halker sale of Shorthorns took place on September 6, and showed a large falling off from previous years. Thirty-one cows and heifers averaged £182 each; the bulls averaged £112 each. Twelve Oxford cows and heifers averaged £312 17*s.* 6*d.* each, and seven bulls of the same family £142 1*s.* each.

Hereford prices.—At Mr. F. Platt's sales at Barnby Manor, Newark, July 21, one bull calf, four months old, sold to Mr. C. M. Culbertson, of the United States, for 100 guineas. Another sold for 150 guineas. One cow and calf sold to Mr. Burleigh, of the United States, for 175 guineas; also a heifer to the same purchaser for 90 guineas. One bull, Grove III, was sold to Mr. Culbertson for 810 guineas. The average price of cows and cattle was £68 17*s.* each, while that of bulls was £107 each. At the sales of Mr. George Pitt, on his farm of Chadnor Court, twenty-one head were sold at an average price of £77 1*s.* 9*d.* each. The highest price paid was for the cow Rosebloom, which was purchased by the Hon. M. H. Cochrane, of Canada, for 260 guineas. He also took her heifer calf at 47 guineas.

Sussex prices.—At Mr. Thomas Knight's sale in October last the prices obtained were, perhaps, the highest on record for the breed; twelve cows brought on an average £42 6*s.* each; four two-year old heifers £49 4*s.* 6*d.* each; six yearling steers £23 10*s.* each; six weanyer heifers £29 4*s.* 6*d.* each; and five weanyer steers £17 12*s.* 6*d.* each.

Jersey prices.—For Jersey cattle some very high prices have been, paid. One bull calf, six weeks old, sold for £2,500. The average prices of those shipped to the United States during the year (over 800 in number) will exceed £45 each.

Prices of Aberdeen bulls.—At R. C. Auld's sale, on the 13th of December last, twelve cows averaged £114 9*s.* 6*d.* each; eleven two-year-old heifers £156 3*s.* 9*d.* each; seven heifer calves £90 7*s.* each, and two five-year-old bulls £53 11*s.* each.

The general average for fifty-one animals was £90 16*s.*

Prices of West Highlanders.—The Earl of Dunmore sold drafts from his superior herd of West Highlanders, in the island of Harris, at Inverness, nine bulls (six being calves) at an average of £21 each; also eighty-four cows and heifers at an average of £19 9*s.* each. The highest prices paid were 50 guineas for a three-year-old heifer, and two heifers of the same age sold at 48 guineas each.

COST OF TRANSPORTATION TO THE UNITED STATES.

I note the cost of transit and attendance on stock as estimated from the consular reports of Dundee and Liverpool, and confirm them as approximations that may be taken as a guide to fluctuating circumstances.

Upon inquiry I learn that the ordinary rates for the transportation of cattle from London to New York are as follows: Bulls and cows alike, £5 to £8, according to demand; calves under 12 months, £3 to £4. Above 12 months the charges are the same as for bulls and cows.

Under the British passenger act steamships cannot carry more than ten head of cattle if more than fifty steerage passengers are on board.

CATTLE CENSUS OF THE UNITED KINGDOM.

The proportions of the different breeds of cattle, and between the numbers of stock that are being reared and fattened for meat and for the production of milk, are partly given in the official reports, but any estimate thereon must be accepted only with great reserve.

The total number of cattle in Great Britain and Ireland in 1883 was 5,962,771.

EXPORTS OF BRITISH CATTLE.

The export of cattle from Great Britain and Ireland to other countries is confined to selections of breeding animals, which, relatively small in numbers, is yet so important from the wide area of demand, that many English and Scotch breeders are restricting their offers of stock, feeling the necessity of reserving their animals for home use. This is especially the case in respect to Scotch Polled, Norfolk and Suffolk Polled, and the Hereford breeds.

The proportion of pedigree stock kept by farmers is still very small compared with the general purpose stock, often pure bred but unregistered, and the various cross-breeds that are commonly preferred both for meat production and milk.

In the table of weights (inclosure 17) it will be seen that the cross-breeds head the list for their daily increase.

ACKNOWLEDGMENTS.

In these concluding remarks, I refer with pleasure to the assistance I have received from Mr. Kains-Jackson in making my inquiries, and I desire to put on record my sincere acknowldgements to my several correspondents for their frank and courteous kindness in giving me full information which, from their great resources and experience, was especially valuable.

E. A. MERRITT,
Consul-General.

UNITED STATES CONSULATE-GENERAL,
London, January 31, 1884.

Inclosures in Consul-General Merritt's report.

1. Notes on French Stock.
2. Report of last French Show, by K. Jackson.
3. Holt Beeber on Shorthorns.
4. The Cattle of Great Britain. (Illustrated.)
5. History of Argus Cattle.
6. Farmer's Hand-Book.
7. Return from Samuel Beck.
8. Return from Mr. R. Stratton.
9. Return from J. B. Lawes.
10. Return from T. H. Risdon.
11. Return from J. and F. Howard.
12. Return from Alfred Taylor.
13. Return from T. Duckham.
14. Return from W. C. Morland.
15. Return from J. Treadwell.
16. Return from North Devon.
17. Giving names of prize breeders.
18. Catalogue of Mr. Aylmer's stock.
19. Notes from Buckinghamshire.
20. Return from Colonel Kingscote.
21. Table of milk record.
22. Report on dairy trials.
23. Table of weights.
24. Number of selected portraits.

[Such portions of the above-mentioned inclosures as are not incorporated in the consul-general's report, and are otherwise of practical value to American agriculturists, will be found in the supplement.]

CATTLE BREEDS OF THE UNITED KINGDOM.*

The great importance of the information called for to a vast number of people and of interests in the United States led me to seek out an authority of undoubted experience and ability in England, to furnish the desired data in behalf of American agriculturists and others. I adopted this plan for the reason that, in order to make it specially useful, the report should be full and reliable in every respect.

As a matter of course I could not be able to equal an adept in this particular line of investigation, for the reason that the subject is one covering such a wide field and one beset with so many difficulties that only one having an extensive acquaintance with English breeders and breeds of cattle could do the subject justice.

I was most fortunate in securing the services of Mr. James Long, of Hetchin, England, a well-known authority on agricultural subjects both in England and on the continent, who has prepared the accompanying clear, strong, and exhaustive report.

It will be found that great care and attention have been given to this report, and that its impartiality and fairness are beyond question. Where so many interested dealers in and breeders of cattle have to be consulted, it is important that the facts about such breeds should be stated by one who is perfectly free from bias in any respect. This has been done in this report, and I submit the same with full confidence that Mr. Long's acquaintance with our agricultural interests, through this valuable mass of information, will lead to a desire on the part of our agriculturists to follow up the results of his future investigations as they may hereafter be given to the public.

ALBERT D. SHAW,
Consul.

UNITED STATES CONSULATE,
Manchester, *February* 19, 1884.

---

* This report was prepared for Consul Shaw, of Manchester, by Mr. James Long, of Hetchin, England.

UNIVERSITY

A.—INTRODUCTORY—BRITISH CATTLE AND CATTLE IMPORTS.

The annexed particulars, referring to the only pure races of cattle known in the United Kingdom which are essentially British, will be found in almost every case very complete and answer every question put in the circular. The exceptions are the Shetland, the Galloway, and the Sussex, about which it is most difficult to obtain technical information. Some twenty Sussex breeders have been addressed, but their answers are not entirely satisfactory, but the information given will be found reliable in every way. The Shetland is an almost entirely unknown race, and the Galloway, to which I desired to give a fuller place, I hope to supplement; the editor of the Herd-Book, who is collecting information, promising to send it to me shortly. In all, the fifteen British breeds are treated, and the information given is based upon that furnished by nearly a hundred of the leading breeders in the country, and which has been arranged by the writer, who has added much which an extended experience has enabled him to rely upon. It will be noticed that almost every breeder speaks of his own race as the best; this is natural enthusiasm, and I have in some cases been compelled to slightly tone the rather exaggerated praise bestowed upon one breed in opposition to another. Particulars are added with reference to breeding, feeding, soiling, shipment, and scientific dairy instruments, and centrifugal cream separators,* which will be found very complete, the two last named subjects being especially familiar to the writer, who has investigated them in each European dairy country. Drawings or wood cuts are annexed as well of these machines and instruments as of the chief races of cattle.

Foreign cattle are little kept in England, and almost all the small herds which had been formed have been dispersed or have degenerated on account of the Government action entirely preventing importation. Dutch cows were at one time very largely used for milk production while French, Spanish, and German beasts were imported in immense numbers for beef. Now the only countries sending live animals in any numbers are Denmark and Sweden and Norway; the first named doing an immense trade last year, leading the United States during the first five months, since when she has started a large company and is building a new fleet of ships for further extending the trade. The Danish cattle come from Aalborg, in Jutland (which port I visited last year), to Newcastle and Hull, and are chiefly Jydsk or Jutland, a medium-sized race of moderate quality. A few Swiss cattle are kept in England, the writer having a few years ago formed the largest herd; the beasts are large, silver-grey in color, slightly too heavy in bone and skin, but very large milkers, good feeders for the butcher, and extremely hardy, living where the majority of other beasts would starve. These beasts are extremely profitable and the handsomest of any known race in color. French cattle are not bred in England, but the Shorthorn is largely bred in France for crossing upon the Charolaise, Cotentin, and Nivernais beast, which it much improves, the Government keeping up one pure Shorthorn breeding establishment for the purpose. In my numerous visits among the French breeders I have found their opinion of the Shorthorn to be that it is better than any race they have, and considered to be the best in the world for crossing. This, however, is not bred to such perfection as in England.

---

* These special papers will be found in the supplement.

Best importing cattle.—The best beasts to import are:

> *For meat.*—The Shorthorn, the Hereford, the Aberdeen Poll, the Galloway, the Devon, the Sussex, and the Longhorn.
> *For beef and milk combined.*—The Shorthorn, the Red Poll, and the Devon.
> *For milk alone.*—The Ayrshire, the Shorthorn (not pedigree), the Red Poll, and the Kerry.
> *For butter.*—The Jersey, the Guernsey, and the Red Poll.

For bleak, cold, or wet districts:

> *For beef.*—The West Highland and the Welsh.
> *For milk.*—The Kerry.
> *For beef and draught.*—The Sussex, the Devon, the Welsh, the Highland, and the Longhorn.

Cost of British cattle.—The cost of animals of these races depends solely upon whether pedigree is desired or merely good, useful specimens such as the best farmers select for their own use. The following figures, however, may be entirely relied upon for useful non-pedigree beasts well selected:

Breeds.	Bull, 1 to 3 years.		Cow.		Heifer.	
Shorthorn	£20 to	£50	£30 to	£35	£22 to	£30
Hereford	20	50	30	35	22	30
Devon	20	50	30	35	22	30
Longhorn	20	50	30	35	25	35
Sussex	20	50	30	40	25	35
Red Poll	20	50	30	40	25	35
Aberdeen	20	50	30	40	25	35
Galloway	20	50	30	40	25	35
West Highland	20	50	30	40	25	35
Welsh	20	50	30	40	25	35
Kerry	20	35	15	25	12	20
Shetland	25	40	20	35	17	30
Ayrshire	35	60	30	40	23	30
Jersey	15	40	25	35	20	30
Guernsey	15	40	25	35	20	30

For pedigree beasts fancy prices are paid, often most unwisely, for unless a particular animal is wanted the best of blood can be obtained if the purchaser can meet with any person to guide him, and who will take the trouble to go with him, at considerably less money than is paid by Americans in the ordinary way. I frequently see buyers (English) who purchase for fashion, giving high figures for animals, while better animals in the same herd are overlooked, although they could be bought at market price.

Number of cattle in the United Kingdom.—The cattle in the United Kingdom are as follows: In England, 4,250,000; in Wales, 651,000; in Scotland, 1,095,000; in Ireland, 4,096,000; total, 10,097,000. Of these there are cows in milk or in calf: In England, 1,650,000; in Wales, 200,000; in Scotland, 395,000; in Ireland, 1,401,000; total, 3,724,000—a decided increase, but considerably less than ten years ago.

Imports of cattle and cattle products into the United Kingdom.—The imports have considerably decreased, owing chiefly to the cattle-disease restrictions, and the same cause has prevented animals being more largely bred. The imports were: In 1865, 283,000; in 1871, 248,600; in 1876, 271,000; rising in 1880 to 389,000, and falling in 1882 to 343,000.

In the year 1882, 314,000 cattle were brought into the metropolitan cattle markets, of which 50,129 were foreign. The average price of beasts in 1882 was, for inferior, 4*s.* 3⅗*d.* per stone; second class, 4*s.* 9⅗*d.*; third class (large, prime), 5*s.* 7½*d.*; fourth class (Scots), 5*s.* 10½*d.*

In 1882, 228,429 cwt. of salt and 463,952 cwt. of fresh or slightly salted beef, 201,000 cwt. unenumerated, 560,000 preserved, &c., other than salted and tongues were imported, against 251,000 cwt. of salt, 817,000 cwt. of fresh or slightly salted, 178,000 and 575,000 cwt. of unenumerated in 1881; or, in other words, beef to the value of nearly a million sterling less.

The average weight of cattle received from other countries is: Denmark, 70; France, 103½; Schleswig-Holstein, 85; Netherlands, 85; Norway and Sweden, 78; Portugal, 86½; Spain, 71; Canada, 90; the United States, 101.

England cannot breed sufficient cattle either for beef or the dairy to meet her requirements, and there is a great market for dairy cows at all times.

In the face of existing regulations the best means of sending beef to England is by means of refrigerators, and, where the price will pay the exporter, he may reckon upon a continuous demand. Dairy produce is always in demand, the home supply being far too little, and Denmark, France, Holland, and Germany supplying great quantities. If a fresh-butter trade or a cream (preserved in tins) trade could be established it would succeed. The home-cheese trade is succeeding better, while cheese and salt butter are produced from countries much nearer and at such prices as America could hardly hope to beat.

British cattle are in general so used to a severe, changeable, and moist climate that they are certain to do well in all but very hot countries where herbage is tolerably good.

I have to acknowledge valuable aid from the editors of the Herd-Books of the Red Poll and Welsh; Mr. Barthmore, of Ayrshire fame; Mr. James Guernsey, Mr. Brydon, and the editors of two of our principal journals, and other gentlemen, many of whom are named.

B.—BREEDING CATTLE.

Mr. Burrows says that one of the most important considerations for the breeder must be the adaptability of his stock to the situation and climate, the soil he cultivates, and the crops he can grow. To expose too suddenly some breeds of cattle to the climate of a bleak, hilly country would be to greatly endanger their safety. An Alderney, a Shorthorn, a Hereford, or even a Sussex or a Devon beast might not maintain its condition where a Polled Angus, a Welsh Runt, or a Scotch Kyloe would gain flesh. In such places, and upon a poor, thin pasture, no race of cattle imported from good herbage and a warm and well-sheltered district can be expected to pay the way without considerable outlay in artificial food. An improved breed will, to some extent, have lost those characteristics which at one time adapted the animals to a rougher life, the thick pelt or hide, the coarse hair, and abundance of bone and muscle.

In selecting an animal for breeding or fattening, it is advisable to look for a moderately small head and a placid countenance; a fine muzzle, with good open nostrils; length in the neck and depth in the shoulders; a broad and straight back and a good round barrel; width across the loins and between the fore legs; large girth behind the shoulders, and full and heavy flanks. With such points we may expect to rear and fatten stock capable of laying the greatest amount of meat upon the prime parts. The hide of such an animal should be mellow and covered with soft and glossy hair, and the bone should not be coarse.

The form of a beast is a matter of primary importance. In the Shorthorn, the Hereford, and the improved Angus, we have this in perfection. The wide and level hips are accompanied by a massive loin and deep, long, and square quarters. The springing ribs give to the body nearly a vertical section. In a perfect beast the breast should stand prominently out between the fore legs, coming down almost upon a level with the knee-joint. Given a wide back and a good wide breast, and most other good points are insured. When well fed the flank of such a beast in handling appears to drop into the fingers. It will prove to be a grazier's without, a butcher's within.

In the matter of breeding for economical meat production, the cardinal point to be kept in view is early maturity. Under present circumstances of farming, with higher rents than of yore, heavier expenditure on labor, increased taxation, and a score of other ills to which farming is heir, early maturity in the animal and the production of the largest amount of meat with the smallest amount of offal should be the aim of the breeder and the grazier. Close observation will generally convince us that most of our races of cattle and classes of sheep have some peculiar properties which especially adapt them to the districts in which they have been bred and grazed for generations. This fact should not be lost sight of. But in selecting the improved breed of each kind we obtain the best meat-producers. This remark applies to cattle, to sheep, and to pigs alike. In such the active or even restless habits of the original breeds have, by selection, regular attention, and good feeding, yielded to docility, or in some instances even to a certain sluggishness highly favorable to fattening. Easy access to food has reduced the proportions of bone and muscle, so that a pure-bred and a high-bred beast is often the best manufacturer of meat from any given amount of fodder, roots, corn, and cake. The advantages of a pure breed or a first-cross are numerous. There are few greater disappointments than for a favorite cow to breed back.

Age for breeding.—Upon the most contested point of the earliest age for breeding we have valuable opinions from many well-known authorities. Mr. Thomas Duckham, M. P., himself an eminent breeder and exporter of Herefords, in a lecture given before the Breconshire Chamber, quoted the opinion of Dr. Hitchman, chairman of the Derbyshire Agricultural Society, to the following effect: That the desire for present advantage in breeding leads to great evils in the future. By placing animals too young into breeding condition you tax nature too heavily, and two evils ensue—the parent is stunted, and the progeny is smaller than it otherwise would be. When nature is busily employed adding to the growth—*i. e.*, to the size and completion of every muscle, bone, and viscera of the animal—every particle that goes to the building up of the animal system being derived from the blood of that animal, the blood being supplied with those materials exclusively from the food which is taken into the stomach and digested, every organ of the body (the stomach, the liver, lungs, heart, &c.), being taxed to the utmost to fabricate the necessary materials for the growing muscles, ligaments, and bones of the young animal, by causing this creation to be impregnated at such an early period in its growth you call a new set of organs and functions into activity; and, further, you call another creature into existence, having like structures to be built up. But while you do this you cannot add to the digestive or the assimilative powers of the animal; you have no more material with which to supply the two bodies than you had for the one.

Individual cases of success from early breeding may be quoted, but the general results, as ascertained over wide areas, are against it. The certain results of breeding from heifers at too early an age will be a race of cattle diminished in size and weakened in constitution. From 2¾ years to 3 years old is quite early enough for a heifer to calve if she is to be the mother of a long line of noble animals. And no bull can be freely used without injury until he approaches two years old. In any system of breeding the time for dropping calves must, to a great extent, be regulated by the accommodation afforded, and by the length of time which the animals are to be kept upon the land before feeding out or breeding. For economical meat production I know no time preferable to the very early spring. Cows, when not required for the dairy and in-calf heifers, can be cheaply kept in the straw-yard during the winter if they are to calve down in the spring; and thus more bullocks can be fattened out upon the fodder and the root crops. But if the breeding animals are turned upon really good pasture during the summer when they are in calf, they frequently lay on fat and produce puny calves. Where the progeny is to go out as a fat steer under three years old, this time of calving is well adapted, as it gives the animals three summers at grass and only two winters in the yard.

Before calving, exercise in good open yards is far preferable to tying up in stalls. Too high a condition at the time of calving is apt to produce inflammation, resulting in milk fever and speedy death. When the eye at such a period has a glassy appearance some aperient medicine should be instantly given. About half a pound of Epsom salts, with some powdered ginger and a little sulphur and niter, will answer the purpose if given in time.

C.—STOCK-FEEDING.

Food of young stock.—Food of young stock must be essentially bone and muscle forming, and it is well known that the continuous grazing of pastures by young stock and by dairy cows very rapidly exhausts the bone-earths, so that the land deteriorates and becomes year by year less adapted to rearing or dairying. Consequently, the ultimate success of either system pursued for any length of time upon the same land must depend very much upon the feeding of artificial food or upon top-dressing. A cow in full milk and yielding 750 gallons a year gives up in that milk the earthy ingredients of 33 pounds of dry bones. If this milk be sold off the farm or be made up into butter and cheese for market, of course the whole of it is lost to the land; and as this loss is equal to 30 pounds of common bone-dust, and every calf reared may be considered to carry away another 10 pounds per annum, the condition of such pastures can be kept up only by supplying in some form to the land the ingredients of 50 pounds of bone-dust every year. It is well known that in the animal rapid growth and quick fattening are opposite qualities; so, to encourage both, the muscle and bone forming constituents and the fat-forming elements must be given at the same time. In a general way, with liberal feeding, the animal makes more progress up to two years old than ever afterwards. With an animal in its natural state, the waste of the body is just counterbalanced by the food consumed. All excess of food beyond waste goes to form bone and muscle in the growing animal and fat in the mature one.

The object of the meat producer should be, by a liberal supply of food beyond natural requirements, not only to maintain this equilibrium, but also to create an artificial condition favorable to the production of fat. When the ox is thoroughly fattened every cell throughout its cellular tissue is well filled. In the beef the fat will be firm and solid and of a rich creamy color. The fat in mutton is whiter and greater in proportion to the carcass. In pork the proportion is still greater. The more we restrain the movements of the body the greater is the aptitude for fattening. Contentment aids the formation of fat. Violent exercise, by stimulating the lungs, consumes the fatty matters. The size of the lung has a marked influence upon fattening. A large lung, developed by abundant exercise, burns away the heat-producing matter and retards fattening. On the other hand, a small lung and a small liver, though they render the possessor much more delicate, are favorable to fattening. In animals nature provides in a time of plenty for some of their requirements in a time of scarcity. Starch and sugar maintain heat and vitality, but unless there is a supply of the fats and oils the progress will be slow, because the maintenance of the vital principles taxes the latter. All vegetable foods vary with the age of the plants yielding them and the soil they grow upon. Hence the care necessary in selecting seeds for laying down pastures and in cutting and harvesting hay and straw. When grass is comparatively young it abounds in flesh-forming substances and in sugar. As the plant ripens the sugar becomes changed into starch and the starch into wood fiber. This shows the desirability of cutting all grass crops for hay before they are fully ripened. Cattle fed upon over-ripened hay have to consume some 13 or 14 per cent. more of indigestible woody fiber.

Value of various feeds.—Some experiments in feeding with hay alone have shown that in a large ox the store condition may be maintained by giving it about one-fiftieth of its own weight per day, or, if working, one-fortieth. A fattening ox, having nothing else, will consume from one-twentieth to one-twenty-fifth of its live weight, according to the degree of fatness it has attained. Sheep are said to consume about one-thirtieth part of their live weight of hay per day. These figures will show us that when hay commands a good price in the market it is not advisable to use it in any large quantity alone as a meat producer. With hay slightly moldy or much weathered, the process of steaming chaff, with an admixture of some maize meal, finely ground linseed-cake, or even bran, renders it more palatable and much more nutritious, as it greatly increases its digestibility. New hay is unwholesome and innutritious as compared with good old hay. After-math hay is better adapted for cattle than for horses. Straw is, perhaps, less in favor than formerly as a cattle food.

Ungenial seasons, wet harvest, and blight and mildew in the crops have lessened our dependence upon it, and the high price it has of late years realized in the market has placed it more on a par with hay for feeding out. But the practice of cutting down large quantities of it as it comes fresh from the threshing-machine in the summer time, mixing with a ton of the cut straw about a hundred weight of green-cut fodder and a bushel of salt, is kept up in many places; and when the admixture is properly made so as to produce a slight fermentation, it makes a very economical winter feed. The fermentation in straw increases its albumen about one per cent. and its feeding value as much as 25 per cent. Green oat straw and pea straw fed out together are but little inferior to hay. The oat straw of Scotland, where the crop is cut much greener than ours, far surpasses that of this country in feeding properties. Oat straw and turnips in Aberdeenshire, without hay, corn, or cake, fatten many a good ox for the London market. With good oat straw *ad libitum* and an allowance of 10 stone of white turnips, or 7½ stone of swedes, a well-bred steer will fatten rapidly. Or, if 7 or 8 pounds of mixed bean meal and linseed cake be giuen, one-half of the roots may be withdrawn. A ton of such straw cut up and slightly fermented, with an addition of 200 pounds of good linseed cake, is equal in feeding properties to a ton of the best hay. There are great advantages to be derived from a proper admixture of foods as well as from judicious and progressive changes. But all changes should be both gradual and progressive if we are to receive the maximum of benefit from them.

Carefully conducted experiments have demonstrated that under ordinarily favorable circumstances the consumption by a steer or bullock of either 8 pounds of bean meal or of 6 pounds of linseed cake will produce one pound increase in the live weight of the animal, but if these foods are used in combination, *i. e.*, if 8 pounds of the one be fed out with 6 pounds of the other, the increase in the live weight of the animal will be not 2 pounds, as we might expect, but 4 pounds; a conclusive proof that judicious admixture is the economical system. In the present instance the linseed cake is eminently a fat-producing food, and the bean meal a flesh-forming one. A chemical analysis of foods compared with the actual results obtained from practice, proves that we may obtain a pound of flesh from every given number of pounds of dry nutritive matter which those foods contain. With the ox it takes 12 or 13 pounds of nutrition to yield a pound of flesh; with the sheep, 9 to 10 pounds; and with the pig, from 4 to 6 pounds. Thus 100 pounds of swedes contain 90 pounds of water, and are, consequently, when fed off, equal to the production of about a pound of flesh. One hundred pounds of Indian corn or maize, containing only 13 pounds of watery substances, will produce about 9 pounds of flesh. Again, it has been ascertained by careful experiments that equal mixtures of maize, peas, and oats, though 7 per cent. lower in nutritive qualities than corn alone, may be fed out, weight for weight, with like results.

D.—STOCK—WEIGHT AND MEAT YIELD.

Measure, weight, and yield of meat.—An accepted theory is that 14 pounds of live weight in sheep will yield 9 pounds of meat and 5 pounds of offal, and 14 pounds of the live weight of a beast 8 pounds of meat and 6 pounds of offal. But the proportion between the live weight in the animal and the offal it will produce will depend very much upon the size of the animal and the degree of fattening. Other things being equal, it will give the highest percentage of meat in the greater weight. A well-bred and well-fed bullock of 120 imperial stone live weight may be estimated to yield from 61 to 64 per cent. of beef. If the same animal be fed up to 140 or 160 stone of beef it would probably yield near 68 per cent. of beef, whereas one of only 70 or 80 stone would not yield more than 57 to 58 per cent. In each case a well-bred heifer of the same weight will exceed the steer in its beef-producing qualities by 2 or 3 per cent. Newly-shorn sheep, weighing about 12 stone, would average from 63 per cent. to 65 per cent., and in proportion for larger weights if at the same time the breed be not one of the coarsest. The more finished the feeding the higher the percentage of meat to offal in everything.

A tolerably correct estimate of the weight of a beast may be ascertained by measurement, and the process is not a difficult one. But whoever undertakes to solve the problem in this way should himself be a good judge of a beast, and should know something as to the length of time the animal has been in the stalls, the kind of food supplied, and the characteristics of the breed. Cattle which fatten at an early age lay on more fat externally, whereas the late-fattening breeds have more internal fat.

The method of measurement, as summarized by Curteis is to take the girth immediately behind the shoulder, drawing the tape fairly tight; then take the length from the shoulder to the tail end, each place being determined by an imaginary perpendicular line let fall and clearing the fore and hind quarters respectively. Square the girth in feet, and multiply the result by the length and the product again by a decimal selected from the following: A moderately fat beast 0.23; fat 0.25; prime 0.26; very fat 0.27. The result gives the weight in imperial stones. But a simpler rule is to multiply the square of the girth in inches by the length in inches and divide the product by 7238, and the quotient will give the weight in imperial stones. Another rule is to multiply the square of the girth in feet by five times the length in feet and divide by 21, and we have the same results.

(1) RED-POLLED CATTLE.

The Red-Polled cattle of Norfolk and Suffolk have within the last two years gained an important place in public favor. Interest in the breed has been shown to such an extent that its history and its claim to recognition can no longer be said to be a mere local matter. These circumstances will doubtless be accepted by my readers as sufficient warrant for a brief notice of the Red Polls.

The history of Red-Polled cattle can be carried back well into the last century. Suffolk had from time immemorial its breed of Polled cattle, producing butter which, one hundred and fifty years ago, was asserted to be "justly esteemed the pleasantest and best in England." Arthur Young, in his "Survey" (A. D. 1794), defines the area "a tract of country 20 miles by 12, * * * the seat of the dairies of Suffolk," which, he said, must be peculiarly considered the headquarters of the Suffolk Polled stock, though he found the breed spread over the whole country. In this survey we get the first accurate description of the breed. Though Arthur Young makes no note of Norfolk Polled cattle, yet advertisements of sales held in and from the year 1778 prove that dairies of such animals were numerous in the county, and that they extended from the northern boundary of the Suffolk "headquarters" well into the center of Norfolk.

An old Elmham tenant, who survived till 1872, recollected Red-Polled cattle on the estate so long ago as the year 1780. At Shipdham they were greatly valued from a date certainly as early. At Necton they were kept from a remote period. The predominant breed in Norfolk at that time (see Marshall's "Rural Economy of Norfolk," notes written from 1780 to 1782) was, however, a "Herefordshire breed in miniature" and "the favorite color a blood-red, with a white or mottled face." Marshall, fortunately, preserves for this generation a record of the process by which the excellencies of this now extinct old Norfolk blood-red stock have been combined with the proverbial merits of the Suffolk Red-Polled. He says there were several instances of the Norfolk breed being crossed with Suffolk bulls, and that the result was "increase of size and an improvement of form."

Color.—Color was, in the opinion of the old fanciers of Suffolk Polls, a distinctive characteristic. Mr. M. Biddell, speaking in 1862, could "recollect the time when no other color than red would be looked at in a Suffolk cow," and in the same discussion on the breed it was admitted that "the red cow had established the breed." Previous to that meeting of the Suffolk Agricultural Society there was a tendency being developed to get rid of the color distinction. This may have arisen from the remembrance of the fact that "red and white, brindle, and a yellowish cream color" had been an accepted color, as representing good milkers. In Norfolk, as has been said, red was the favorite color, but in a few districts sheeted Polls were preferred. The fashion has during the last forty years set steadily in one direction. The red which is now recognized as the mark of excellence is a deep, rich blood-red, and the spot of white, which Mr. George used to say was a sign of good breeding, has been well nigh crossed out. The predominance of deep red shows plainly the degree in which the old Norfolk breed has affected the Polls, and, on the contrary, the freedom from horns and from white on the udder and face is evidence of the persistence of the Suffolk Polled character. The amalgamation of the two varieties—Norfolk Polled and Suffolk Polled—may with certainty be traced from the year 1846. Both counties henceforth met in an honorable competition in the show-yard. Purchase of the handsomest and truest bred red stock became the desire of all the breeders. The result of the zeal was soon made evident not only at county shows but also at Royal meetings.

Characteristics.—The standard description of Red-Polled cattle was agreed upon by the breeders in the autumn of 1873, after my proposal to establish a herd-book of the breed had met with ready acceptance. This standard description read as follows:

> *Color.*—Red; the tip of the tail and the udder may be white. The extension of the white of the udder a few inches along the inside of the flank, or a small white spot or mark on the under part of the belly by the milk veins, shall not be held to disqualify an animal whose sire and dam form part of an established herd of the breed and which upholds in all other essentials this "standard description."
>
> *Form.*—There should be no horns, slugs, or abortive horns.

The points of a superior animal are as follows:

> *Color.*—A deep red, with udder of the same color, but the tip of the tail may be white. Nose not dark or cloudy.
>
> *Form.*—A neat head and throat. A full eye. A tuft or crest of hair should hang over the forehead. The frontal bones should begin to contract a little above the eye, and should terminate in a comparatively narrow prominence at the summit of the head.

In all other particulars the commonly accepted points of a superior animal are taken as applying to Red-Polled cattle.

Weight.—At the close of the last century the animals when fattened seldom exceeded fifty stone (720 pounds). This is the report both of Marshall and Young. The former says:

> The superior quality of their flesh, and their fattening freely at an early age, do away with every solid objection to their size and form.

There has been great improvement in this matter of weight for age, while there has been no deterioration in the quality of the flesh, butchers now, as then, purchasing the Red Polls readily, because they die well, and the meat is equal to the best Polled Scot or Highlander. A few of the recorded weights of fat beasts will show this:

The live weight of a three-year-old steer, of the Biddell strain, shown in 1876, was 25 cwt., 2 qrs.; its girth nearly 9 feet. The return of this animal's dead weight has not been recorded; in fact, it has been found most difficult to get such facts, though they are most useful for purposes of comparison. The two following records will, however, partially serve this end:

Mr. A. Taylor's Red-Polled steer, first prize at the Smithfield Club Show, 1881 (aged three years seven months, sire Norfolk, dam Suffolk), had a recorded live weight of 17 cwt., 1 qr., 1 lb. Its dead weight was 91 stone, 6 pounds (1,280 pounds), a percentage of 66.74 of the live weight. The same exhibitor's heifer (aged three years, one month, three weeks) had a live weight of 13 cwt., 3 qrs., 14 lbs. Its dead weight was 72 stone, 7 pounds, a percentage of 65.31 of the live weight.

Mr. J. J. Colman's prize cow, Fannie (aged ten years, three and a half months), which had produced five calves, had a live weight of 17 cwt., 22 lbs., and was sold by public auction at Ipswich at a sum which equaled 4.375*d.* per pound, calculated on the live weight.

The dead weight of a three-year nine-months old Norfolk steer, shown at Norwich in 1878, by the Prince of Wales, was 80 stone, 4 pounds; of Mr. A. Taylor's three-year ten-months old steer, first-prize winner at the same show, 111 stone, 12 pounds.

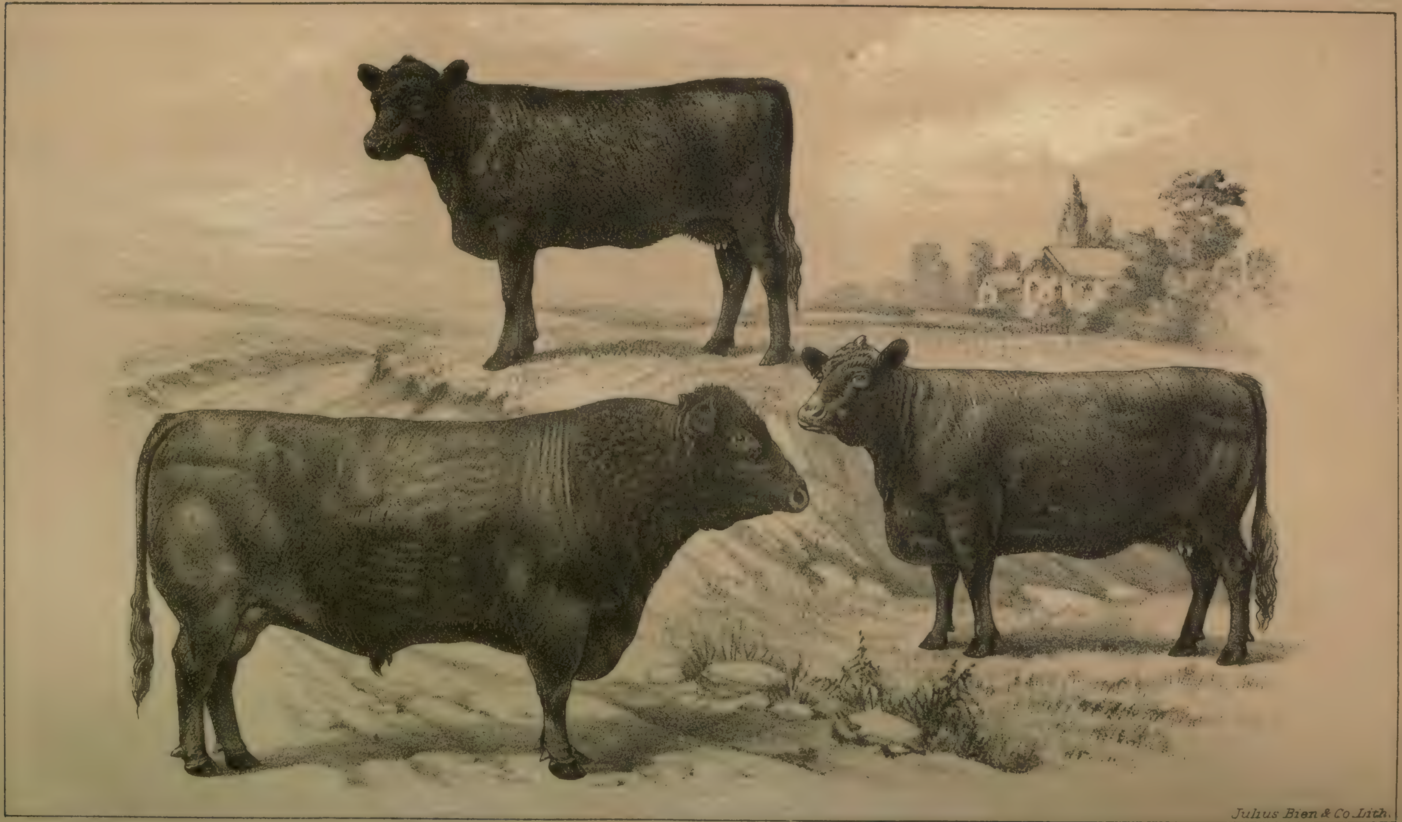
This record is nearly equaled by that of a bull of Mr. Lofft's breeding, which, when slaughtered in "fair condition only," gave a dead weight of 110 stone.

These are not mentioned as exceptional weights; they happen to be available because they were recorded at the time of slaughter.

Portraits of Red Polls.—Davyson 3d 48, the bull shown in the illustration, was bred by Mr. John Hammond of Bale, East Dereham; was sold as a two-year-old to Mr. J. Foster Palmer, and was subsequently bought at auction by Mr. W. A. Tyssen Amherst, M. P., at 205 guineas. He was calved in August, 1873, being of the Davy (H 1) tribe, and sired by a bull of Powell blood, as was his dam. He was the reserve at the Norfolk show of 1875, and since that year has never been beaten at a royal or county show, winning sixteen first prizes and six cups. Dolly (No. 2), calved November 3, 1879, the older of the two females in the illustration, was in Mr. Colman's cup collection in 1881, and again in 1882. In each year she was first in her class, and last year she also won the cup offered for the best Red-Polled cow or heifer at the Norfolk show. She is a heavy-fleshed animal, inheriting that characteristic from her great-great-granddam, Minnie, the foundress of a Necton tribe, and herself the daughter of the Red-Polled bull which won first prize at the Norwich Royal in 1849. This Minnie tribe realizes high prices, and is, as a rule, very good both for milk and for flesh. The sire of Dolly, and also of the other female in the illustration, was Rufus, a bull of Powell's famous Rose tribe, bred by the late Lord Sondes.

Silent Lady (O 9), calved December 18, 1880, the yearling heifer shown in the illustration, was also in Mr. Colman's cup collection of 1882. She traces back to one of Sir E. Kerrison's grand cows—a superior milker.

Milk yield of Red Polls.—Mr. Ewen recently gave a daily return of the milk yield of one cow, extending over eight months, and the monthly averages of four others in the Didlington House Farm herd. The cow, Davy 27th, whose daily record is given, is of the same tribe as Davy 24th, whose average yield for seven months was stated in the Almanac of the Live Stock Journal to have been 42 pints per day. Davy 27th was selected by Mr. Ewen to test the question of the value of the Guénon escutcheon theory as applicable to Red-Polled stock. She was fed in the ordinary Norfolk fashion, in common with the cattle in the large herd


Julius Bien & Co. Lith.

A GROUP OF RED POLLED CATTLE

DAVISON 3RD SILENT LADY DOLLY

owned by Mr. John Hammond. The following is the result of the trial:

Daily yield of milk, in pints.

[Davy 27th, H 1. Register No. 1451.]

Day of month.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
1	....	48	46	41	40	39	36	34	26
2	....	48	46	41	40	39	36	34	24
3	....	48	42	41	40	39	36	34	24
4	....	48	42	41	40	39	36	34	24
5	....	48	40	41	40	39	36	34	24
6	....	48	40	41	39	39	36	34	23
7	....	48	38	41	39	39	36	34	23
8	....	52	38	41	39	39	36	34	23
9	....	56	38	41	39	39	36	34	23
10	....	56	38	41	39	39	36	34	23
11	....	56	38	41	39	39	36	34	23
12	....	56	38	41	39	39	36	33	23
13	....	56	38	41	39	39	36	83	23
14	....	52	37	40	39	39	35	33	23
15	....	46	37	40	39	39	35	33	23
16	Calved	44	37	40	39	39	35	33	23
17	....	44	36	40	39	39	35	33	23
18	....	42	36	40	39	39	35	33	22
19	....	40	35	40	39	39	35	33	22
20	16	40	35	40	39	39	31	33	22
21	16	40	35	40	39	30	34	33	22
22	20	44	35	40	39	39	34	33	22
23	34	48	35	40	39	39	34	33	22
24	42	48	35	40	39	39	34	33	22
25	42	48	32	40	39	38	44	33	22
26	42	48	35	40	39	38	34	33	22
27	48	48	35	40	39	37	34	33	22
28	44	48	36	40	39	36	34	33	22
29	44	48	36	40	39	36	....	26	22
30	48	46	36	40	39	36	....	26	22
31	48	....	36	....	39	36	....	26	22
Daily average for month	....	49.93	37.45	40.43	39.1	38.5	35.0	32.6	22.8

Daily average for five months, 41.04 pints; for six months, 40.1 pints; for seven months, 39.01 pints. Total yield from September 1 to March 31, inclusive, 8,273 imperial pints; to April 30, 8,957 imperial pints.

The Didlington herd tests were carried out by Mr. John Wallis, the steward, with the following results in pints:

Name of cow.	Date of calving.	September.	October.	November.	December.	January.	February.	March.	April.	May 1 to 21.
Wild Rose Cousin	August 28 (4th calf)	40	38¼	38	36	34½	34	32	26	16
Golden Locks	September 7 (2d calf)	42	41	40	39¼	37	36½	35	32	26
Gentle Rose	December 17 (3d calf)	....	.....	....	34	32½	32	31½	30¼	28
Pansie	January 4 (3d calf)	....	.....	....	.....	38	36	34½	33¼	32

In England systematic tests for milk and cream are not carried out by the farmers. It is only natural to suppose that a cow whose average yield is 25 to 30 pints of milk per diem during two-thirds of the year, is more profitable than one which gives a good pail for half that period.

Nancy 2nd (K 19) dropped her fourth calf on August 9, 1881. In the week ending February 5, 1882, she gave 210 pints of milk; percentage of cream, as indicated in a graduated test-tube after the milk had been at rest twenty-four hours, 16.5. Each of the cows in the herd had, in February, a daily feed of 4 pounds mixed linseed and decorticated cotton-seed cake, 4 pounds bran, 1 bushel carrots, and 1½ bushels barley straw and hay chaff. This cow, Nancy 2nd, when in full profit, August 31, was giving 36 pints of milk per day.

Davy 24th (H 1), shown three years in succession, dropped her second calf on January 27, 1882, and gave a daily average yield of milk from that date to August 31 of 42 pints; percentage of cream, 18. Cherry Leaf (V 3) dropped her third calf on May 16, and gave, to August 31, an average daily yield of 42 pints of milk. Flirt 3d (V 1), a cow of similar breeding to Cherry Leaf, gave, six weeks after producing her first calf, a yield of 249 pints of milk in the week; percentage of cream, 15. Waxwork 6th (U 9) (the tribe in which the bull Slasher is included) produced her first calf on January 8, and on August 31 was giving milk which yielded 21 per cent. of cream.

The following returns are from the Necton Hall herd (Mr. R. H. Mason's):

In the third week of February the cows were on pasture (very light land) most of the day, with a few roots; at night they each received 7 pounds cotton cake and spiced cake, 7 pounds bran, 14 pounds hay and cut straw. Nancy 3d (N 3), aged six years, dropped her calf in December, 1881; on February 18 yielded 28 pints of milk at two successive milkings; percentage of cream, 16. Pet (N 1), age 6 years, dropped her calf January 22; on 18th February yielded 23 pints of milk; percentage of cream, 35. Tulip (N 4), with similar conditions, yielded 25 pints of milk; percentage of cream, 34. And Tulip (N 7), aged 9 years, which dropped her calf in October, 1881, was yielding 26 pints of milk per day in February.

Tests were also taken at the end of August, when the cows were all at grass, with the following results:

Empress (N 4), which dropped her third calf on April 10, yielded 22 pints of milk per day; percentage of cream, 29. Sultana (N 5), which dropped her fourth calf on March 22, gave 30 pints; percentage of cream, 26.

The butter being produced by eleven cows in August was 80 pounds, and 120 pints of new milk were sold per week. In the year 1881, from the herd of 13 Red Polled cows, 8 heifers, and 1 Alderney, the produce of marketable butter was 3,120½ pounds; new milk sold, 725 gallons; cream sold, 101 pints; money value, independent of skim milk, £260. In the year 1882, from 14 cows, 6 heifers, and 1 Alderney, the produce of marketable butter was 3,434 pounds; new milk, 686 gallons; cream, 13½ gallons. The money realized was £281 4*s.* 2*d.*

Primrose (K 6), an eleven-year old cow in Lord Kimberley's herd, gave on winter feed (hay, chaff, bran, and cake), six weeks after calving, 32 pints of milk per day, and the marketable butter produced was 9 pounds per week.

Mr. Lofft, Troston Hall, reported the testing of two of his cows of the Handsome (U 3) tribe, each of which consumed per day 4 pounds cotton cake, 2 pounds Simpson's meal, 6 stone of beet root, and 1½ bushels of chaff. Handsome 5th, four months after calving, yielded 28 pints of milk per day and 7 pounds of marketable butter per week. Handsome 6th yielded 32 pints of milk per day and 10 pounds of butter per week.

Mr. G. Gooderham, Monewden, uniformly causes his cows to breed very early, and the secretion of milk is thus fostered. One of his cows, Wild Rose of Kilburn, which was first prize-winner as a yearling at the Royal meeting of 1879, produced her first calf when wanting two days of being two years old. Before she was three years old she produced a second calf, and again within twelve months a third. Eight weeks after this last calf was dropped she gave 30 pints of milk per day on winter feed, and her average of butter was 9 pounds per week, taking all the year, since she never goes dry. In June 1882, six months after calving, she won first prize at the Essex show as a milker; her dam won a like honor at the Suffolk show in June, 1881.

The herd of Mr. J. J. Colman, M. P., which has seven times in eight years won the cup offered at the Norfolk show for the best collection, includes the seven-year old cow, Silent Lass, the yearling heifer shown in the illustration.* This cow, on winter feed, gave 37 pints of milk per day, eight weeks after calving. In May, when the cows were at grass—very poor herbage, growing on a marsh—I tested the quality of the milk, using for the purpose Heeren's milk tester, the "pioskop" of the Hanover Vulcanite Company. The milk was drawn on to the pioskop direct from the udder, when milking had been half done. Silent Lass, five months after calving, yielded milk which contained more fatty particles than are found in rich milk as marked on the tester. Even the first milk drawn from the udder of Dolly, six months after calving, was "normal" according to the tester, and her average yield was very rich, as was also the yield of the other cows tested, Rosa (P 3), seven months after calving, and Rosebud 2d (K 17), nine months after calving.

Mr. Garrett Taylor's large herd at Whitlingham, near Norwich, is kept exclusively for the supply of milk to customers in the city. The cafés, which have a large demand for the article, have familiarized the public with the fact that the milk of the Red-Polled cattle is exceptionally rich. One of the Whitlingham cows, on winter feed, five weeks after calving, gave 32 pints of milk per day; another, 27 pints.

Mr. B. Stimpson, of Morton, reported two of his cows, on winter feed, as yielding daily, Cheerful, ten weeks after calving, 30 pints of milk, and Silky, six weeks after calving, 26 pints. The butter made from their milk amounted to 14½ pounds per week.

A four-year old cow of the Eaton strain, in Mr. J. F. Rogers' herd, at Swanington, yielded, five weeks after calving, on very poor food—hay, pulped swedes, and cut straw, with 3 pounds of decorticated cotton cake—28 pints of milk per day. His herd of seven cows (six Red-Polled and one Shorthorn) produced in the year ending September 30, 1882, 1,435 pounds of butter, which, with milk sold amounting to £11 18*d.* 10*s.*, made the total return £118 15*d.* 3*s.*

A return of the test of two cows of the Glemham strain (Mr. Moseley's), already mentioned (in Mr. J. M. Spink's herd, Harpley), gave 53 pints of milk as the yield per day on winter feed, and 23 pounds 2 ounces of butter per week.

Red-Polled cattle are found to lay on flesh rapidly on pasture of the poorest character, where other breeds need to have an additional supply of richer food. The dry temperature of Norfolk and the poor pasture seem more particularly to have had their effect on the size of the stock. The first cross-stock sired by a Red-Polled bull, no matter of what horned breed is the dam, is usually red in color and polled in character. Such animals when fat are eagerly bought by the butcher. I have recently seen a number of such cross-breeds, the produce of a Red-Polled bull and a pure-bred Jersey cow, and am told the cross is an excellent one. Some of the animals have a few silver hairs mixed with the red coat; all were polled and all had black noses.

The chief hindrance to the extension of the breed exists in the scarcity of the stock which has in great measure arisen from the fact of rinderpest having a few years ago been fatal to a large proportion of the cattle then in the more noteworthy herds. Fashion also had a marked effect· Shorthorns and Devons were at one time in such favor that polled cat.

---

*The yearling in the illustration is the "Silent Lady," not the "Silent Lass," and, according to Mr. Long, was calved on the 18th of December, 1880, and was consequently only about four years old at the date on which his report was written. It would therefore appear as if the "Silent Lass" here referred to is another than the cow "Silent Lady" shown as a yearly in the illustration, or that an error has been committed in the age as well as in the name. (Note by the Department.)

tle were despised and their merits ignored. With registration, however, and marked progress made in Red-Polls within the last ten years, the shortness of numbers is being in some measure compensated for, noblemen and gentlemen now sparing no pains to make the breed a success.

Weight and measure of Red Polls.—Mr. Tyssen-Amherst, M. P., of Didlington Hall, has, at my request, weighed and measured several cattle in the Didlington herd with the following results, the stock living entirely on the grass of very poor land:

Name.	Age.	Weight.	Length from point of shoulder.	Total length.	Girth.
BULL.	*Years*	*Pounds.*	*Ft. In.*	*Ft. In.*	*Ft. In.*
Davyson 3d	9	2,093	5 2	7 10	7 10
COWS.					
Davy 24th (H 1)	5	1,344	4 9	6 9	6 9
Dolly (P 9)	5½	1,320	4 6	....	6 4
Wild Briar (B 9)	6	1,436	4 11	....	6 8
Pretty Flower (B 18)	6	1,427	5 00	....	6 7
Pansie (B 20)	3	1,281	....	....	....
Bertha (A 20)	3	1,354	....	....	....
Cheerful (K 19)	7	1,514	5 00	....	6 8
Nancy 2d (K 19)	8	1,650	5 2	....	6 6
Countess (L 11)	3	1,350	....	....	....
Dolly (N 6)	6	1,472	....	....	....
Nancy (N 15)	9	1,649	....	....	....
Satin (T 7)	3½	1,358	4 8	6 7	6 9
Norfolk Witch (W 14)	5	1,387	4 7	....	6 7
Poppy (U 3)	2¾	1,484	4 11	6 10	7 1

Slasher, 577, bred by Mr. Lofft, combining Norfolk and Suffolk blood, had a live weight of 27 cwt. (3,024 pounds) at the age of four years seven months; girth, 8 feet 2 inches. His son, Rollick, 558, of the same tribe as Dolly, No. 2 (see illustration), weighed at the age of two years eight months eighteen weeks, 19 cwt., 3 qrs., 14 lbs. (2,226 pounds), and its dead weight was 100 stone of 14 pounds. The bull Cortes, 645, weighed when one year eight months old, 12 cwt., 20 lbs. (1,363 pounds); eight weeks after, his live weight was 12 cwt., 3 grs., 9 lbs. (1,437 pounds); girth 6 feet 10 inches. King Egbert, 688, at fifteen months three weeks, weighed 10 cwt., 3 qrs., 2 lbs. (1,206 pounds); girth 6 feet 6 inches. Three bull calves at Didlington, under five months old, all the get of Davyson 3rd., had a live weight of 3 cwt., 1 qr. (364 pounds); 3 cwt., 14 lbs. (350 pounds), and 3 cwt., 12 lbs. (348 pounds), respectively. A Davy heifer at Didlington, sired by Davyson 7th, and calved January 27, 1882, had on May 31, 1883, a live weight of 8 cwt., 1 qr., 14 lbs. (938 pounds); girth 6 feet 1 inch. A Primula heifer, calved January 3, 1883, weighed on the following May 31, 3 cwt., 1 qr., 20 lbs. (380 pounds). A Red-Polled calf at birth has been found to weigh 3 qrs., 10 lbs. (94 pounds).

Practical experimental breeding of Red Polls.—Mr. R. E. Lofft, of Bury St. Edmunds, a famous breeder of the Red-Polled variety, gives some very unusual information. He says:

> My farm is composed of drift clay and sand, or both intermixed, and rests on a substratum of chalk. The mean temperature of 1883 was 48.6; rainfall 26.19. I have never tested my dairy, but only a few cows, on request. Good cows give from 4 to 6 gallons of milk per diem, and make 7 to 10 pounds of butter per week. I set more store upon cows milking through than on giving a large quantity after calving. We have had cows that have not been dry for four years, but this is of course exceptional. I am breeding cattle of three different sizes: First, a large size more exclusively for beef. Of this sort a bull might weigh 1 ton to 1 ton 7 cwt.; a cow from 15 to 17 cwt., and a

steer at two years old, 12 to 13 cwt. Second, a middle-sized animal for general purposes, milk and beef combined. A cow of this sort might weigh 11 to 13 cwt., a bull about 15 to 18 cwt., and steers at two years old in proportion. Third, a small-sized animal exclusively for milk. This at first I am trying to breed as small as I possibly can, with an abnormal development of milk. I have now been breeding this sort for some two years, and I fancy I shall be able to breed animals smaller than either Kerry or Breton cows.

I have now been breeding Red Polls for about thirteen years; my present herd consists of about 70 head of cows. Up to this time, I have not been able to weed out as freely as I could wish, as Red Polls are scarce. Now, I shall be able to draft a number for fattening purposes every year. As a rule I only sell calves, or young bulls of about two years old. I prefer to fattening off cows to selling them for breeding or milking purposes. My fat steers are generally sold rather under than over two years of age; heifers that are rejected for some reason or other, generally have a calf and are fattened off at three years.

I consider the Red Polls to be a color variation of the old Suffolk cow, which is of a light yellow or pale ginger color, and I fancy it too is a color variation of the old original White Polled cow kept by the monks, and now in a few instances kept tame in noblemen's parks. I have the mind to set up two small dairies of these two varieties; I have already secured some and got the promise of others. My present herd is comprised of about equal parts of blood from Norfolk and Suffolk stocks. I am in favor of line breeding, unless, of course, it shows bad results. My idea of breeding three different sizes is quite contrary to the usual ideas upon the subject, but for the present I see no reason to regret the course I have taken. As far as I can see, judicious selection is more prepotent than either food or climate. The fact that I hope, starting with the same blood and food and other conditions of existence, to produce animals that weigh over 1 ton, down to animals that only weigh 3 cwt., as I feel quite certain I can, points to the same conclusion. When I first began to breed Red Polls, they had short wire coats, but now they have long silky coats, with soft mellow skins. As far as I can see, a first-class milking habit is more difficult to fix in a breed than any other characteristic; the material may be present, but one cow stores it up and another yields it up to the milkman. Cows that are good milkers often breed heifers that are only the common run, although put to good bulls out of good milking strains.

As regards the proportion of lean to fat, Red Polls have on the market a good reputation, and fetch advanced rates; some price as much as a shilling per stone more than Shorthorns.

My cows are fed on a great variety of food, according to the crops of the year. In summer they are out at grass from May to October; at times they have a bait of cabbages or turnips on the pastures, with 2 to 3 pounds of cotton cake or linseed; sometimes lucern in the barn, or they may be turned out to clover. In winter they are fed with cake, hay, cabbages, swedes or turnips, or gorse, with a few bushels of meal, just as it may happen. Grains as well as malt dust is good food, but all depends on circumstances—such as home crop or cheapness of artificial food.

As for the working powers of the Red Polls, I have never worked them myself, as I am a large horse breeder, but they can be worked with a collar. I have seen some working in America, but never in England.

Since the above was written I have received the following information from Mr. Gooderham, the well-known breeder of this race, whose cattle are so famous for their milking qualities. He states that the annual average yield of milk per cow is about 1,000 gallons, and that 20 pints is the usual quantity required to produce a pound of butter. He does not manufacture cheese and is, therefore, unable to give the quantity necessary to make the like quantity of that article. The live weight of the Red Polls, he informs us, is from 1,400 pounds to 2,000 pounds, at maturity, and that the proportion of meat of a fattened steer, also at maturity, is nearly equal to that of a Scot. His land is composed mostly of heavy clay, and his grasses consist chiefly of old pasture. The summer food of his Red Polls is 4 pounds of best linseed cake daily, with grass. In winter he feeds them upon cut hay, turnips, swedes, mangolds, and carrots, or cabbages. In the early part of the winter he prefers feeding them with two bushels of swedes and carrots, and with the like quantity of mangolds in the spring.*

---

* For much of the special information given in the foregoing report on Red Polls, Mr. Long expresses his obligation to Mr. Euren, editor of the Herd-Book, and to Mr. Lofft, the famous Suffolk breeder.

(2) LONGHORN CATTLE.

The Longhorn cattle, as a distinct breed, became famous first of all in the district of Craven, in Yorkshire, on whose phosphatic soils they attained a degree of inherent vigor and hardiness which their descendants have faithfully transmitted through many generations, in various kinds of climates, and on widely-differing soils. Long before the Shorthorns became famous outside the Teeswater district, the Longhorns had attained a proud position and a widely-extended popularity. During the greater part of the last century, and in the early years of the present one, they were at once the pride of wealthy breeders, and, in varying degrees of purity, the practical stock of dairy farmers in the midland counties of England. In Ireland they were and still are known, in contradistinction to the modern breeds reared there, as "the old Irish cow."

Though the Longhorns, less, as well as more, than a hundred years ago were the prevailing cattle of the midland counties, Derbyshire appears to have been then, as it is now, the stronghold of the more famous herds. Sir Thomas Gresley, of Drakelow House, Burton-on-Trent, appears to have been the first prominent improver of Longhorns, and he took "delight in keeping a dairy of cows similar in color and shape" before the renowned Robert Bakewell was born. Three-quarters of a century ago, Mr. Princep, of Croscall, is said by Parkinson to have had, perhaps, the first dairy of cows in the county where that preeminence is defined to mean symmetry, size, and aptness to fat. The same authority tells us that Mr. Princep had 500 guineas offered for a two-year-old bull, and 30 (another account says 50) guineas a cow for the use of his bull to 30 cows; and he was also offered £2,000 for 20 dairy cows.

A four-year-old steer of his weighed, when killed, 248 stone of 14 pounds to the stone; and, in addition, there were 350 pounds of fat, while the hide weighed 177 pounds. The breed, however, had previously become supremely famous under the hands of the greatest of all breeders, Mr. Bakewell, of Dishley, in Leicestershire, whose efforts, eminently successful as they were, lay in the direction of combining in the same animal the four great qualities of beauty and utility of form, quality of flesh, and aptitude to fatten, which, he rightly judged, were not incompatible with each other. But, in attaining these points, he wholly neglected the no less important one of milk, and we cannot but regard this omission as a national misfortune, for numberless other breeders have been taught to sin in the same way. Mr. Lythall, editor of the recently established Longhorn Herd-Book, makes the startling assertion that to this line of breeding "must be traced the decline of the Longhorns in public favor at the early part of the present century." This is quoted as a warning to the Shorthorn breeders of the present day.

Yet the old Longhorns, even many of the highly improved ones, were celebrated for their milkiness, less though for quantity than for quality of milk; but it was Bakewell's one fatal misfortune to destroy this reputation. Youatt says of him:

> Many years did not pass before his stock was unrivaled for the roundness of its form, the smallness of its bone, and its aptitude to acquire external fat, while they were small consumers of food in proportion to their size; but at the same time their qualities as milkers were very considerably lessened. The *grazier* could not too highly value the Dishley or new Leicester Longhorn, but the *dairyman* and the *little farmer* clung to the old breed as most useful for their purpose.

It would thus appear that the "unimproved" Longhorns were good milkers, or the dairymen and little farmers would not have thought so much of them. Whilst Bakewell was alive there were many famed herds of Longhorns within an hour of him in the saddle, but in less than forty years after his death there was not an animal of the breed left on the old farm at Dishley, and not a dozen within a circuit of 12 miles from it, so completely did the loss of milkiness disestablish the old breed from the district in which Bakewell had made it immortal.

Three-quarters of a century ago Mr. Mundy, of Markeaton, was a well-known breeder of Longhorns, and it is related that one of his cows, named Thistle, made 17 pounds of butter a week. Mr. Cleaver, of Leamington, tells of a brindled cow he knew almost as long a time ago which filled a 4 gallon milk-pail up to the brim, and afterwards gave another quart to the milkmaid; and of a two-year-old heifer which was so prolific that in ten years she brought thirteen calves, and was such a milker that all the dairymaids set a world of store by her. Mr. Shaw, of Fradley, Old Hall, near Lichfield, says:

> A Longhorn cow some years ago, on Lord Bagot's estate, near Rugeley, had such an immense udder that the man when he sat down to milk her could not reach across it, and had either to milk one side first and then the other, or two men would be milking the same cow at once; and he records his opinion that very few, if any, breeds of cattle excel the old-fashioned Longhorn for milk.

And as to its quality he says:

> Whenever we have had occasion to change our dairymaids the new ones have invariably been struck with the superior quality of the milk and cream obtained from our Longhorns. One of them remarked, "Dear me! what a thickness your cream is; and the skimmed milk looks as good as the unskimmed did where I last lived; it does not look at all blue, and the other did."

The maid had been previously living where a large herd of Shorthorns was kept.

Mr. R. H. Chapman, of St. Asaph, remarks that the Longhorns were numerous in some parts of Wiltshire forty or fifty years ago, and they were called the "Spreads," the "Bradles," the "Crumbles," or the "Broads," as the forms of the horns indicated. It is true there is no sort of uniformity either in the length or form of the horns of Longhorn cattle. It was said of them—

> They were distinguished from the home breeds of other counties by a disproportionate and frequently unbecoming length of horn. In the old breed this horn frequently projected nearly horizontally on either side, but as the cattle were improved the horn assumed other directions. It hung down so that the animal could scarcely graze, or it curved so as to threaten to meet before the muzzle and so also to prevent the beast from grazing; or immediately under the jaw, and so lock the lower jaw; or the points presented themselves against the bones of the nose and face, threatening to perforate them.

The color of the Longhorns is sometimes the opposite of ornamental, and a white irregular streak commonly runs up the back from the tail to the shoulders. But, as a rule, they are picturesque and pleasing cattle, the color being most commonly brindle. It cannot be denied that as a breed they possess valuable points. They have, under proper management, early maturity, fatten well on a moderate quantity of food, and their flesh is of good quality; and while some of them are very deep milkers, they are all favorably known for the quality of the milk they give. It is not likely, however, that they will ever reattain the position they formerly held, but it may be confidently anticipated that their reputation will revive. Indeed, in some localities and with many breeders their reputation can only be said to have declined, if at all, in part and temporarily, and it is equally true to say that there are many signs of an extended revival of the ancient reputation of this quaint old breed of cattle. Many splendid specimens have been and still are exhibited at the Birmingham fat-stock shows, and it is hoped this will always be the case, for to Birmingham is due the credit of having stuck to the old breed during a good part of the period when it was left out in the cold by most other agricultural shows. The number of Longhorn herds is increasing in the midland counties, and the names of many gentlemen mentioned in the Herd-Book index are an ample guarantee that the old breed will not only not be let die, but that it will again be helped on into popularity.

Characteristics of the Longhorns.—The characteristics of the breed are noteworthy, for it possesses a character of its own, resembling, however, the Herefords more than any other breed. The head is finely cut, but long, and tapers well towards the muzzle, being moreover well set onto a thin, shortish neck. The horns are, except in the bulls, long, fine, and tapering, hanging well down by the cheeks and then point forward by the muzzle; the usual length in the cows and oxen is from 2½ feet to 3 feet, but those of the bulls rarely exceed 18 inches. The shoulders are comparatively fine, but well set on, and the legs show good bone. The girth is for such cattle, in comparison with the Shorthorns, small; but the loin is broad and the hips wide and outstanding. The chine is rarely full except when the animal is fattening, and then it will put on a rare amount of flesh in this part. The thighs are long and fleshy, with small, clean-cut legs. The hide is of fair thickness, mellow, and soft to the touch. The flesh is of fine quality, the bone plenteous, but not coarse, and the offal small. Regarded as graziers' stock, they possess sterling qualities and must take high rank, their carcasses carrying very heavy loads of beef. They fatten rapidly and easily, and although scarcely coming to maturity so quickly as the Shorthorns they nevertheless approach these, their supplanters, very closely, leaving very little to be desired in this respect.

As milkers, one admirer of the breed says:

> We know them to be excellent cattle, as witness the fact that the majority of the pure breed Longhorn herds are kept as dairy cattle. They are free and long milkers, the milk being, as a rule, superior in quality to that of Shorthorns. Their use for crossing purposes is not very extensive, because there are few instances in which their place can advantageously be taken by the Durham, and it seems as if we must be content to use them as a pure breed. No doubt there is room for them, and we are inclined to the opinion that the judicious intermixture of a little of the Longhorn among one or two breeds would tend to reduce that fineness of character which is becoming dangerously general in some of our best kinds of cattle.

With regard, however, to the milking value of the Longhorns as a breed, a great deal cannot, we think, be said, for justly esteemed as it formerly was it has of late been comparatively little bred for this purpose, the Shorthorn having taken its position in the dairy in almost the whole of the Longhorn district; but there are numerous instances of great milking capacity in the breed, and we believe that by a little attention in a judicious crossing and in cultivating the milking power, it could be raised to a very high standard, certainly equal and possibly superior to the Shorthorn.

As with some of the other less cultivated breeds, the Longhorn is not now bred for the dairy. There are a few isolated cases in which they are used, but we very much question their absolute purity, and even in these cases the dairies are so small that statistics would be of little value. It may be generally stated, however, that it is a better cheese-making than a butter-making breed, and does extremely well upon the rich old pastures of the midland counties of England, which are not greatly exposed to the weather, and which are usually of a stiff loam, with a substratum of clay. The Longhorn, which lives to an exceedingly old age, is, moreover, a decidedly large breed, and in the year 1882, at Birmingham, the winning steer, aged 3 years 7 months, weighed 15¾ cwt.; the second prize, 3¾ years, weighing 15½ cwt. At the same time the first-prize cow, 5½ years, weighed over 16 cwt.; the second prize, a heifer, aged 4½ years, being 15½ cwt. The following year, at the same exhibition, the first-prize steer, 3 years 8 months, scaled 17 cwt., the second and third being almost as large; while in the cow class the first prize, 4 years and 10 months old, weighed 13¼ cwt., the others being all larger.

The prevailing color of the best exhibition beast is brindle and white or red and white, the former being preferred.

As may be expected from the extraordinary length of the horns of these beasts they are seldom used upon the farm for draft purposes, although their docility and great strength otherwise fit them for such a purpose; but the farmers in the district in which they are chiefly bred almost to a man prefer horses.

Productiveness of the Longhorns.—The system of feeding is generally that adopted with the Shorthorn, cake and roots being the principal part of their diet, and both suiting them admirably. At the same time there are differences of opinion as to the quantity of turnips given, some breeders preferring a minimum quantity with a maximum quantity of cake; others again, and it must be confessed without much reason, giving an enormous quantity of roots and a similar quantity of cake or corn. It was the custom in some districts not very many years ago to compose the dairy herds of Shorthorns and Halfhorns, the latter of which were, for the most part, a combination of Shorthorn and Longhorn; but of late years very little of the Longhorn element has been introduced among them. Of a herd of 25 to 35 of these, a cow would give from 3 cwt. to 4 cwt. (the long hundred of 120 pounds) of cheese during the season of about seven months, the price being sometimes as low as 50 and as high as 95 shillings per cwt. Of an experiment with 6 Shorthorns and 6 Longhorns in the June season, it was shown that whilst the majority of pounds of milk was 152 pounds to 135 in favor of the Shorthorn, the cheese curd from the larger quantity was only 14½ pounds, as against 19½ pounds.

Another experiment with 36 Shorthorns against 32 Longhorns showed that the 605 pounds of milk from the former made 66½ pounds of curd and that the 553 pounds from the latter made 69 pounds. The plainest cows are often the best milkers, and the milk from a seven or eight year old is thought to be the richest. In winter they are most frequently kept on barley straw and pulped turnips, with hay in addition near calving time. The calves, which generally are somewhat difficult to rear, are usually dropped in March and April, and some of them never suck their mother. They have new milk from the first, which is lessened when the cheese season begins, and gradually they come to oil-cake and linseed boiled in whey or the overnight's milk. As they get older they become heavy-fleshed and prove themselves well fitted for the butcher. For the food which the Longhorn consumes it will certainly give as good a return, and generally a better, than other beasts, and as an animal for the adornment of the park or the home pasture of the hall or grange it will be found most suitable.

(3) THE SHORTHORN CATTLE.

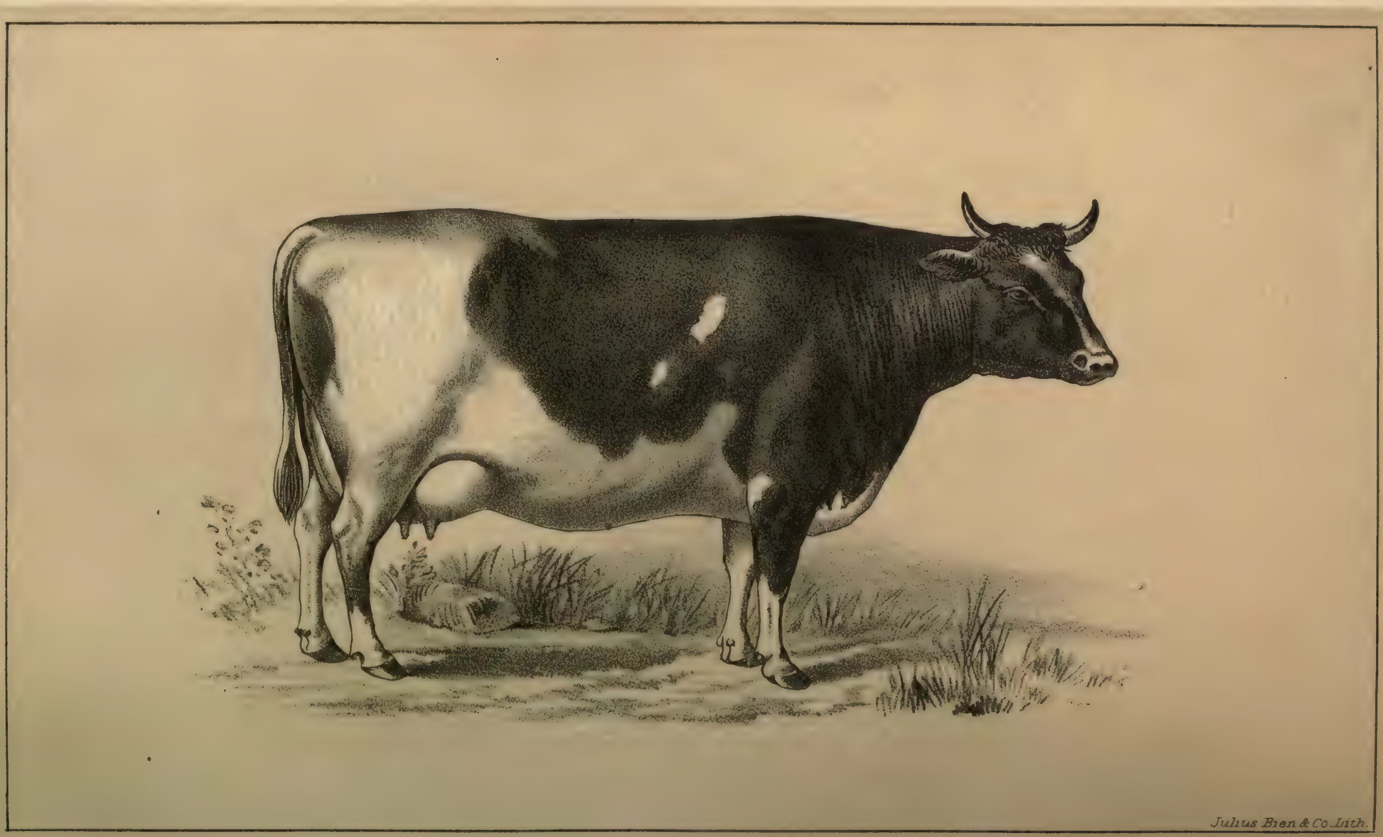
The Durham, or Shorthorn, is not an ancient breed. It cannot lay claim to such antiquity as the Longhorn; for while the Longhorn seems to have been the aboriginal cow of Ireland, the Shorthorn is a cow of modern days.

"Diversities in appearance, shape, habits, and produce," says a well-known writer on cattle breeds, "have arisen, partly from modern artificial breeding, but chiefly from the prolonged and combined influences of soil, climate, pasturage, and general treatment." The centuries that have elapsed since the dispersion of the ancient breed of cattle, and their long-continued location in different districts, under such varied conditions of climate and pasturage, have produced great changes in the appearance of members of the same race. Especially is this so in the case of the cattle whose home has always been in the more civilized and more highly cultivated parts of England. Originally of a shy and nervous disposition, spirited and active, of hardy constitution, and with a tendency to roam at will, they have, during the course of so many years of intercourse with their owners, lost much of their hardiness and activity, and also much of their nervousness and fear. Rich pasturage, mildness of climate, protection from the winter storms, the increasing use of grain and artificial foods, and the general improvement in cultivation, has had a most marked effect on the appearance and general characteristics of the cattle brought within such influences. This is shown in the development of a surprising bulk of flesh on a much larger frame. The successive conquerors of Britain—the Romans, Saxons, Danes, and Normans—it must be remembered, all brought with them cattle from their own countries, and these, becoming domesticated, were mixed and crossed with the above, and were finally lost in the resulting race. The conquered area provided an improved breed of cattle, while the more remote and inaccessible parts of the Kingdom, remaining free, bred the same animal as existed in the early days of British history.

About the year 1640 a bull and some cows were brought into Holderness (East Yorkshire) from Holland. They had large shoulders, flat sides, coarse necks, thick heads; their valuable points were small and their coarser points large; yet these cattle were of larger bulk and the cows better milkers than were then known, and on this account they were greatly esteemed and used for crossing with the native cattle. The cross soon showed great and lasting improvement. Holderness is a rich grazing district, and the native cattle found there at that period were of the best in the land. The new breed thus formed by the admixture and crossing of these imported animals soon asserted their superiority over all other races. Such was the origin of the Shorthorn.

Another source of the Shorthorn, and in some degree passing the prior claim to being the original, was a race of cattle which from time immemorial had existed in Durham, in the basin of the Tees, whence they were named the Teeswater. In color and appearance they resemble the breed of the present day; they had a good, mellow touch, and in butcher's parlance "killed well;" were light of offal, had wide carcasses and deep forequarters, and were greatly esteemed by all who were acquainted with them. About the same period, or a few years later than their introduction into Holderness, the Dutch cattle were also imported into the valley of the Tees and were crossed there with the native breed, giving rise to the Teeswater Shorthorn, or Durham. At a still later date numerous bulls were imported from the Continent, principally from Holland. The native cattle in Yorkshire and Durham were crossed with

PLATE 8



Julius Bien & Co. Lith.

A DAIRY COW.

GOOD CROSS BREED

them, and the new breed so produced received the name of the Shorthorn.

It is not necessary to follow the history of the breed further. As it became known it came into popularity and quickly spread and multiplied. About the year 1754 the brothers Collings, of Darlington, entered upon a new departure in the history of this new breed, applying Bakewell's principle of selection in the breeding of the Shorthorn; a step which produced the happiest consequences and the most important results, improving the frame and proportions of the cattle, and largely developing and increasing their milk and fattening properties. For many years they followed this course, and when the herd was dispersed in 1810 the prices realized at its sale were altogether unprecedented. Since then much has been done by many persons to improve the breed.

It would be impossible to particularize those who have done such great service, but we may mention the names of Bates (whose great success must be largely be attributed to his purchases at Collings's sale), and of Booth, the founders of two great families of Shorthorns whose fame is without compare.

The points of the Shorthorn.—The color may be entirely red or entirely white, or a mixture, either color predominating, but not in spots. The fashionable color has varied at different times. Once a creamy white was all the rage; so was all the red, and the flecked roan, but a good Shorthorn cannot be a bad color so long as it is not spotted. The skin around the eye and the bald of the nose should be of a rich cream color, the head rather small in proportion to size, and tapering in shape, with a fine muzzle; a clean, calm, and prominent eye; horns rising near the crown, short, smooth, and white, but moderately sharp, and of fine quality; the head should be well set on a deep form and broad neck. As to the frame, it should approach as exactly as possible to the shape of a parallelogram, from whatever direction viewed; the back perfectly straight and level from the neck, just below the horns, to the top of the tail; the shoulders well back in the body, and the brisket projecting in short rectangular form. The top of the shoulders should be perfectly level and the loins wide and level across the hock bones; the hind quarters long and straight, as should the shoulders, forming perpendicular and well-marked lines; the buttocks to the hocks, and the shoulders to the knees full and well developed, but below the bones should be fine and clean and clearly formed; the twist full and wide; the flank full and thick, and the tail moderately fine, and not too much covered with hair. The ribs should be inclined to the shape of a barrel, but when the animal is seen along the side, it should appear as if perfectly straight and level from the shoulder to the buttock. When seen endwise, it should be equally straight and level from the top of the neck to the root of the tail, and also underneath from the brisket along the belly towards the twist. The hair fine and abundant, soft and glossy; the skin mellow and soft to the touch; the flesh is accumulated on the valuable parts, the fat in due proportion to the lean, and the flesh of the slaughered animal is fine in quality, well marbled, and the meat most juicy and tender. In the bull the head is broader and thicker, and the neck is arched and coarser. In the cow the belly is more pendulous; the thighs slighter, and the loins sometimes hollow.

The appearance of the Shorthorn is exceedingly attractive and symmetrical; its skin is of the richest hue, from the blood red to the pure white or cream or the beautiful delicate roan. Its small clean limbs and handsome apperance have stamped it as the most magnificent breed of cattle we possess.

them, and the new breed so produced received the name of the Shorthorn.

It is not necessary to follow the history of the breed further. As it became known it came into popularity and quickly spread and multiplied. About the year 1754 the brothers Collings, of Darlington, entered upon a new departure in the history of this new breed, applying Bakewell's principle of selection in the breeding of the Shorthorn; a step which produced the happiest consequences and the most important results, improving the frame and proportions of the cattle, and largely developing and increasing their milk and fattening properties. For many years they followed this course, and when the herd was dispersed in 1810 the prices realized at its sale were altogether unprecedented. Since then much has been done by many persons to improve the breed.

It would be impossible to particularize those who have done such great service, but we may mention the names of Bates (whose great success must be largely be attributed to his purchases at Collings's sale), and of Booth, the founders of two great families of Shorthorns whose fame is without compare.

The points of the Shorthorn.—The color may be entirely red or entirely white, or a mixture, either color predominating, but not in spots. The fashionable color has varied at different times. Once a creamy white was all the rage; so was all the red, and the flecked roan, but a good Shorthorn cannot be a bad color so long as it is not spotted. The skin around the eye and the bald of the nose should be of a rich cream color, the head rather small in proportion to size, and tapering in shape, with a fine muzzle; a clean, calm, and prominent eye; horns rising near the crown, short, smooth, and white, but moderately sharp, and of fine quality; the head should be well set on a deep form and broad neck. As to the frame, it should approach as exactly as possible to the shape of a parallelogram, from whatever direction viewed; the back perfectly straight and level from the neck, just below the horns, to the top of the tail; the shoulders well back in the body, and the brisket projecting in short rectangular form. The top of the shoulders should be perfectly level and the loins wide and level across the hock bones; the hind quarters long and straight, as should the shoulders, forming perpendicular and well-marked lines; the buttocks to the hocks, and the shoulders to the knees full and well developed, but below the bones should be fine and clean and clearly formed; the twist full and wide; the flank full and thick, and the tail moderately fine, and not too much covered with hair. The ribs should be inclined to the shape of a barrel, but when the animal is seen along the side, it should appear as if perfectly straight and level from the shoulder to the buttock. When seen endwise, it should be equally straight and level from the top of the neck to the root of the tail, and also underneath from the brisket along the belly towards the twist. The hair fine and abundant, soft and glossy; the skin mellow and soft to the touch; the flesh is accumulated on the valuable parts, the fat in due proportion to the lean, and the flesh of the slaughered animal is fine in quality, well marbled, and the meat most juicy and tender. In the bull the head is broader and thicker, and the neck is arched and coarser. In the cow the belly is more pendulous; the thighs slighter, and the loins sometimes hollow.

The appearance of the Shorthorn is exceedingly attractive and symmetrical; its skin is of the richest hue, from the blood red to the pure white or cream or the beautiful delicate roan. Its small clean limbs and handsome apperance have stamped it as the most magnificent breed of cattle we possess.

Valuable properties of the Shorthorn.—The valuable properties of the Shorthorn as a meat-producing animal are said to be without rival. It produces the greatest quantity of beef, and that of the best quality, and scales the heaviest of any of our herds. It also comes to maturity at a very early age and shows the most kindly disposition to fattening. As a milk producer, the Shorthorn can claim to be in the front rank, though the general opinion is that it must yield the palm to the Jersey and the Ayrshire. For many years past, it must be borne in mind, the breeding of Shorthorns has been conducted solely with a view to the production of beef, but formerly this animal was the deepest and heaviest of any of the milk-producing breeds, and if for a few years it was again bred for the pail, as it is now for the butcher, its superiority as a milker might be regained. As a cheese producer the Shorthorn is admittedly the best. The Shorthorn is to be found everywhere, but its home is in its native place in Yorkshire, and in the eastern counties of England. It is to be found all over England, Scotland, and Ireland, all over America, in Australia and New Zealand. Of all the different breeds of cattle we possess, the Shorthorn has the greatest power of adaptation to varying conditions of life, to changes of soil, of climate, and of pasturage. It thrives nearly as well in the cold, dry northeast of Scotland as in the moist and genial south of Ireland, and is equally at home in the nobleman's park and upon the prairies of Texas.

Shorthorn cross-breeds.—But while it is esteemed of great value on account of adaptability to all climates and soils, it has achieved wonderful results through crossing with other varieties. Crossing with the Shorthorn improves nearly all other breeds by imparting the properties that give value to cattle, viz., size, form, quality, rapidity of growth, early maturity, and aptitude to fatten at an early age. Most especially marked is the improved quality and consequently greater value of the cross between the English Shorthorn and the old Irish cow. The marvelous result is presented in an increase of ten imperial stones' weight of flesh in the animal, in greater size, and in the quality of fattening at least a year earlier than other stock. The enormous improvement that has been effected and that is still being carried on in the breeding of Irish cattle is within the knowledge of every farmer. This improvement has added no less than twenty-five per cent. to their value at a year old, and is the result of crossing with the Shorthorn during the last and present generations.

The Shorthorn is used in Scotland for crossing with the Ayrshire, and it is said that the produce are better milkers than their mothers. It also crosses with the Guernsey with great milking results. It is, however, for the size, the early maturity of growth, and the aptitude to fatten early and quickly that the Shorthorn imparts to other breeds of cattle that is chiefly valuable. Shorthorn steers, or steers of some other breed with a very large admixture of Shorthorn blood, are the favorite cattle for winter and summer feeding in the northern and midland counties of England. In some quarters the Shorthorn may not find so much favor as it once did, and in certain districts other breeds may be more successfully reared and fed; but, for general purposes, upon moderately good land, and in an average climate, the Shorthorn, as a race of cattle, is equal to any, while it is surpassed by none. Distributed throughout almost every county of Great Britain and Ireland, pedigree Shorthorns are now to be met with; there are probably some 600 breeders, possessing about 20,000 cows, and distributing good bulls amongst the breeding herds. But breeders of first-class Shorthorns, says Mr. Dun, have of late years been very generally looking to beef rather than to milk.

How to form Shorthorn dairy herds.—Some sensible and far-sighted breeders have seriously demurred to the neglect of the milking properties of the Shorthorns. Mr. Bates was opposed to overfeeding, kept his stock in a very healthy natural state, and some of his best cows were deep milkers. Mr. Whittaker for nearly forty years maintained the dairy superiority of his Shorthorns, which not only reared their calves, but supplied the people of his extensive factory with milk. He never used bulls excepting from cows which reached a high standard of dairy excellence. Although his famous bull, Fairfax, was the most shapely he ever bred, he was hired to go to Warwickshire, became the sire of many good steers and of a Smithfield gold medallist, but Mr. Whitaker would not use him at home, as he did not consider his dam a sufficient milker. The late Lord Ducie was equally anxious to preserve the milking qualifications of his herd, and was a staunch opponent to overfeeding. The forty-nine cattle at his great sale in 1853 were in very ordinary condition and many were exceedingly good milkers. From these, and other such tribes, where reasonable pains have been systematically taken to maintain milk, pedigree Shorthorn cows can be obtained which will compare with any dairy stock. From such herds young bulls can be selected which may be trusted to produce vigorous, good, thriving animals, with early maturity, good all round, and which will not detract from the dairy profits of the herd with which they are mated. By the use of such sires good thriving young stock are produced, which make the best of their food and time, which, whilst they milk as well as their dams, probably acquire, when dry, greater capability rapidly to lay on beef. I need not here enlarge on the enormous boon it is to the dairyman to have his cows maintain their condition while milking, readily to lay on beef as they are dried, and if required shortly to go to the butcher at about the price they were valued for calving. This combination of good qualities—this milking liberally for eight or nine months, and making, if needful, three or four months later, a good carcass of beef—is pre-eminently secured more rapidly and effectually by Shorthorns than by any other breed.

A very valuable herd of pure-bred dairy Shorthorns could be inexpensively founded in a few years by attending Shorthorn sales, selecting animals merely for their dairy qualities and without regard to fashion or tribe, and mating them with a bull carefully chosen from a heavy milking cow of a well-known dairy sort, such, for example, as the Knightleys. My herd contains animals that have milked twenty-four quarts per day each without any special forcing and milked only twice a day. With more stimulating food and an extra milking even larger results might be obtained. I am inclined to the opinion that pure-bred Shorthorns give richer milk than common-bred cows of no particular type, but no doubt the proportion of cream is affected by the kind of food and quality of land. Bean meal is a favorite "licking" for milk cows with the Yorkshire men; cotton-cake stands next; grains, distillers' wash, and other like articles, whilst increasing the flow, diminish the quality of the milk. Twenty years' experience in milk-selling and Shorthorn breeding brings me to the conclusion that £500 invested in pure-bred Shorthorns, selected solely as dairy animals, and kept to yield milk for sale, weaning and rearing the calves, and selling off the dams as fat when no longer serviceable in the dairy, would in ten years leave better profit than the same amount laid out on any other breed for similar purposes.

In selecting young bulls for dairy herds it is not only essential that they are descended from dams and tribes which have the desired milking capabilities; they ought, also, to carry in their own persons some recognized characters indicative of dairy usefulness. Size, substance, and masculine character, are essential for health and vigor. Close-made, compact sizes, although sometimes captivating on account of shapely, even form, are rarely good getters, either of steers or dairy cows. There is a happy medium between smart heifer-like or steery-bulls, and rough, coarse leggy brutes. The head should be kindly, free from coarseness, but withal of a masculine character, without which a bull is unlikely to leave his mark. I do not object to tolerable growth of horn, which shows constitution. The neck should be rather long to secure carriage and length of carcass, merging in those curved lines of beauty into a well-developed prominent bosom. The chest, necessarily capacious to give ample room for heart and lungs, should approach the oval of the well-bred horse, rather than the round or square proportions of the cart-horse. This will bring the dewlap somewhat near the ground. The shoulder blades will be well laid back; there will be no roughness or overdue prominence of the shoulder points. In a young, growing animal in moderate condition this conformation will entail a somewhat light appearance of the fore quarters and the fore chine may not be so abundantly clothed with beef as the butcher would desiderate. The back and loin cannot be too wide, the back ribs should be well sprung; the narrow weak-backed bull is certain to have the worst of all faults, a delicate constitution. The quarters should be long, well-clothed with lean meat, but alike in bulls and cows of milking proclivities, they will not be so thick and massive as in animals selected more exclusively for beef making. The body will be invested with a skin of moderate thickness, soft and pliant, not papery, and covered with rather long fine hair. The soft undergrowth of mossy hair, so pleasant to handle, augurs fattening rather than milking capabilities. It is not absolutely necessary for ordinary dairy herds that the bull should have a long, fashionable, or even perfectly consistent pedigree, free of the so-called alloy, and satisfying the taste of the critical purist. But a good sound pedigree secures uniform, certain results. A bull whose pedigree is made up of a number of dissimilar strains is unlikely to get his calves with that uniformity of good type which is so desirable. The fashion of the present day is to use young bulls, beginning with them when they are about 15 months, and discarding them often when they are 3 years old; frequently they are slaughtered before their stock becomes appreciated. In olden times bulls were wont to be used charily at first, their progeny were carefully noticed, and a successful sire was used so long as he continued serviceable.

I recently visited the Berkely herd of Lord Fitzhardinge, which is somewhat famous from the fact of his having given £4,500 for the celebrated bull, Duke of Connaught, which I judged to weigh as I saw him well on for 2½ tons. The herd is bred for sale and beef, but in the district, a famous dairy one, were numbers of grand Dairy Shorthorns. Here, as at Lord Ducie's, near at hand, the Shorthorns are all pedigree beasts, and extremely hardy, and certainly not highly fed. To prevent quarter evil, setons are let in below the brisket. The Vale of Berkely is near the Severn, and exposed to southwest gales, which are here very severe.

Dairy Shorthorns.—The following will give some idea of the value of what is known in the midland counties of England as the Dairy Shorthorn, for its milking properties. There are some families of this old race which are famous for their symmetry and meat-producing qualities; others are equally famous for their milk, and in some cases, where the owner of a herd has made it his study for a number of years to breed from milkers only and to produce as large a yield as he possibly can, the herd has become marvelously prominent in this qualification, as in the case of the one to which reference is made below. A year or two ago a member of the British Farmers' Association offered a challenge cup for the best dairy-farm record, and although records have been sent in by farmers and land-owners in different parts of the country, and with regard to different breeds, so far none have equaled that which was sent in by the Earl of Warwick during the past year (1883), although, unfortunately, from a technical error it was not able to compete for the prize.

Wonderful Shorthorn dairy record.—The steward, Mr. Tough, commences his record with a statement as to the analytical value of his milk. On June 2 it was tested by Mr. Bostock Hill, the county analyst, and was as follows: solids, 9.09; fat, 4.37; total, 13.46. It was again tested June 29, showing an increase of .21 per cent., while the fats remained *in statu quo:* solids, 9.31; fat, 4.36; total, 13.67. On August 4 the solids showed a considerable falling off, while the fats were proportionately increased: solids, 9.12; fat, 5.21; total, 14.33.

The Society of Analysts have adopted 9 per cent. as the limit for solids not fat, while Professor Wanklyn suggested 9.5, the limit for total solids being 11.5.

The record refers to the Shorthorn cows, four of which were four years old, four five years old, and two six years:

Number—	Weight on May 1.	Weight August 27, after summer feeding.	Net gain between May 1 and August 27.	Product in milk for one week on May 1.	Product in milk for one week on August 27.	Average daily product for week of May 1.	Product for the seventeen weeks.	Average daily product for the seventeen weeks.†	Percentage of cream per cow on August 27.‡	Milk set for butter.		
										Quantity of milk.	Yield in cream.§	Product in butter.‖
	Stone.	*Stone.*	*Stone.*	*Qts.*	*Qts.*	*Qts.*	*Qts.*	*Qts.*	*Qts.*	*Qts.*	*Pts.*	*Lbs.*
1	78	92	14	157½	112	22½	2,312	19½	11	536	78½	39¾
2	88	94	6	154	118	22	2,328	19½	10	508	79½	44½
3	84	94	10	173	143	24¾	2,838	23¾	10	649	93	55¾
4	88	92	4	126	*136	18	2,426½	20⅓	14½	571	99½	54⅞
5	80	96	16	143½	110	20½	2,137	18	12	470	75	40¼
6	80	80	......	146½	*150	21	2,737	23	11	640	88½	51¼
7	86	96	10	133½	110	19	2,227½	19	13	509	83	44¾
8	80	92	12	130	104	18½	2,048½	17	12	469	76½	39⅞
9	78	94	16	136	120	19½	2,262½	19	10	524	77	42
10	90	100	10	138	114	19¾	2,211½	18½	10	494	74½	40¼

* Only one cow maintained her position.

† The highest yield was of a five-year old cow, calved April 2, which gave in twelve weeks 173, 157, 177½, 198, 185½, 184, 183, 170, 178, 177, 162, 158, or 25 quarts a day for 84 days.

‡ The average is below 11½ for the lot, which is a distinct refutation of the value of the Shorthorn as a butter cow.

§ An averege of 768, a decidedly disappointing quantity.

‖ A total of 453½ pounds from 13,761 pounds of milk, or about 1,030 gallons of cream and showing an average of butter to milk of about 3.29, and cream 43.98. The quantities of skim milk are also shown, and bear a fair proportion to the quantities of new milk used.

It appears that the milk was in part sold and partly set for cream and churned. The quantity sold was so large that the cows yielded, per cow, from this source alone for the seventeen weeks of the trial from £13 to £18 5*s*., No. 3, the big milker, claiming the latter high figure, which is marvelous even without the sum to her credit for butter ann skim milk; and if it were possible to collect dairies of such cows, either one of two things would happen—the compilation of fortunes the general reduction of foreign dairy imports—perhaps, both. Assuming from the yield shown by No. 3 and the return she made that the milk produced 8*d.* a gallon, this would be a decidedly good summer price.

A new feature in this record is the manure, which appears to have been well looked after, and very properly so, especially since, as is seen below, the cows had a considerable quantity of cake. The feeding was—

Food.	Pounds.	Value.		
		£.	*s.*	*d.*
Bean flour	196		16	4
Cotton cake	259		13	2
Palm-nut cake	259		14	0
Grass	19,180	4	19	8
Hay	39		1	7
Straw	748		19	10

Labor is charged 28*s.* 3*d.* per cow, and haulage 9*s.* 11*d.*, making a total of £10 2*s.* 9*d.* per cow; or, when considering the valuation of each animal—for they were valued both at the beginning and end of the trial—an average of £10 14*s.* 1*d.*, the real figures running from £9 4½*d.* in one case to £14 15*s.* 2*d.* in another.

Since writing the above we have felt it necessary to again examine Mr. Tough's record, the yield of milk being so surprising. It will be remembered that Lord Braybrooke's cows gave an average of about 2,100 quarts for the year, and yet, as shown above, Lord Warwick's in every case gave more than this for the seventeen weeks. Lord Braybrooke's, again, averaged 5 quarts to 10 quarts a day for the period in milk (not the year), while Lord Warwick's gave, as shown above, from 17 to 23¾ quarts for the seventeen weeks. With all respect, and we are bound to take Mr. Tough's figures, we consider his record, if not so elaborate as a matter of figures, yet one infinitely more worthy of a challenge cup than any other, for his herd is a truly marvelous one, and will take our American friends all their time to rival.

There are 10 cows averaging 19.77 quarts per day for seventeen entire weeks, one actually reaching 23.84 quarts. This cow returned:

For milk sold (2,189 quarts)	£18 4 10
Butter (56¾ pounds)	3 9 3
Skim-milk (581 quarts)	2 8 5
Manure	0 15 5
Total return for seventeen weeks	24 17 11

Let us see what has been done in the milking competitions as a guide to the value of this return. At the 1880 trials the highest Jersey or Guernsey yield was 38 pounds 5½ ounces; the highest Shorthorn, 50 pounds 5 ounces; the highest Dutch and cross-bred, 43 pounds 12 ounces, and we think we are right in believing that neither at the 1881 nor the 1882 trials were the highest of these figures exceeded. At all events here are cows winning in milking trials which give less in their flush for a single day than Lord Warwick's best average for 119 days. Facts speak for themselves, and it appears to us that Lord Warwick's can not only beat any herd of which the public has lately been informed, but that he would stand the greatest posible chance of carrying off the chief milking trials.

A remarkable herd of dairy Shorthorns.—The following particulars refer to Mr. Hutchinson's herd, well known as a famous one in Yorkshire, and it will be the more valuable, inasmuch as he was the winner of the royal prize for the best farm in 1883. The farm comprises about 250 acres, of which over 100 are grass. The soil is partly on gravel, and the rest on strong clay loam, with bowlder stones. This latter is only moderate, and without liberal treatment would not be very productive. The present tenant on succeeding to the farm inherited a small herd of unregistered Shorthorns, which, with one or two purchases and the use of Warlaby and Killerby bulls, has resulted in a collection of cattle that have won more prizes since they have been shown than any other herd of similar dimensions. The most fortunate investment was Gerty, by Vainhope, bought for 42 guineas when in calf to Knight of the Shire. Gerty had 8 heifer calves, twins twice running, and from her descended Gertrude, Gratitude, Grateful, Gratification, Gratulations, Gratuitous, Gratia, and Glad Tidings.

Another equally remarkable family are the Lady tribe, which we believe were bred by Mr. Hutchinson's father. Of this sort were Lady Playful and Lady Alicia, winners at Taunton and Birmingham, and Lady Pamela, the champion female at the York meeting in July, 1883, a wonderfully true-grown and heavy-fleshed two-year-old, which was first shown as a yearling at Reading in 1883 in a big class. At the last five Royal meetings Mr. Hutchinson has secured five first and three second prizes as well as three champion prizes. This is a record which it would be hard to beat. Lady Pamela is wonderfully thick-fleshed and true-grown, with great ribs and thighs, both upper and under lines perfect. She has won 21 first prizes and has only twice been beaten. Lady Pamela 2d, own sister, a rich roan calf with great length, is also very promising and likely to make a prize-winner, whilst Lady Gratia deserves high commendation. Glad Tidings, another of Gerty's descendants, a handsome three-year-old, was put second at York to Mr. St. John Acker's Lady Caren 9th, both being very good ones.

In the pastures are to be found a lot of lusty cattle of generally uniform type, the best being a fine old cow, Lady Playful (the winner ot fifty prizes); a long level white cow, Gratification; Lady Gracious, by British Lion out of Lady Grace, by K. C. B., a handsome red cow with quality and substance; and a fine old wreck, Lady Laura, which had won for her owner £800 in prizes. The bull in service was a two-year-old, bred by Mr. Talbot Crosbie, out of Riby Marchioness, which was quite a useful animal, with great length and substance. On the farm, in addition to many other animals, were 29 cows, 13 heifers, 10 bull calves, 10 heifer calves, and 1 bull, the whole showing that it was heavily stocked, and indicating also the high condition and large produce obtained from the land.

Treatment of dairy Shorthorns on a model farm.—Mr. Turnbull, of Hull, is another winner of a first prize at the Royal, and, as a very large dairy farmer, occupying as he does more than one farm, and keeping and breeding Shorthorns, we give the following particulars respecting his system. In 1881–'82 no less than 120 acres of Mr. Turnbull's Twyer's Wood Farm had been drained at 2 feet deep, the landlord finding 3-inch pipes, and the tenant leading and putting in the same. Deep draining does not answer on the Holderness clay, though a depth of from 30 to 36 inches might have been preferred. Over 90 acres have been limed with 5 tons of magnesian lime per acre, which has proved of the greatest advantage in securing healthy roots and improving the quality and yield of grain, whereas as compost with road-scrapings the effect in improving the herbage, and especially in developing the clover plants, has been very marked. The land is generally a strong loam, of a fertile character.

The stock on the farm comprised 40 cows and heifers, principally Shorthorns, of excellent type and grand milking properties, some cross-bred Ayrshire and Shorthorns, 10 capital two-year-old steers, and a very useful two-year-old bull, selected with due regard to the milking properties of the dam. Although the grass is of excellent quality, it is supplemented with cake. Thus, from May 1 to October 21, the cattle, accord-to age, have from 2½ pounds to 7 pounds of cake daily (two-thirds cotton and one-third linseed cake).

They live out day and night, except at milking time (4 a.m. to 6 a. m., and from 2 p. m. to 3.30 p. m.). From July the dairy cattle have a daily allowance of green tares, and in September and October they have cabbages in addition to cake and grass. The heifers in calf run out on grass both summer and winter, but are housed in a straw yard at night in winter, when they are supplied with from 14 pounds to 21 pounds of hay, according to age and size. Heifers due to calve in the spring are allowed about 2½ pounds of linseed cake daily for two months before calving. From October 21 to April 30 the cows are allowed from 21 pounds to 28 pounds of hay (one-third long and two-thirds chaffed), with pulped roots, the quantity of the latter ranging, according to the size and condition of the animals, from 36 pounds to 84 pounds, the artificial food for cows in full milk comprising 3 pounds of linseed cake and 3½ pounds to 7 pounds of crushed oats. Heifers in full milk are fed with about 21 pounds of hay (two-thirds as chaff), with 56 pounds of pulped roots, and 5 pounds of linseed and cotton cake, in equal proportions, or a similar weight of linseed cake and crushed oats. Oat straw when well got is substituted for a portion of the hay. Mr. Turnbull considers that 10 pounds of oat straw are equal to 7 pounds of hay.

The grass farm of 140 acres at East Park, which Mr. Turnbull holds, is occupied on a lease for five years from April, 1880, and has received very liberal treatment for so short a term, as it includes boning a considerable part of the pasture, the liberal application of fold yard manure, both to grazing and mowing lands—71 acres being devoted to meadow on which was an excellent crop of hay—and the erection of a considerable length of strong posts and rails, which cost about 1*s.* 6*d.* a yard fixed. The buildings comprise the larger portion of the hall-stables and outhouses, and by judicious alterations have been rendered very convenient for breeding and rearing stock, which is the main business here.

The management of young stock is admirable, some details of which we will give. As to the treatment of the calf: It is removed at birth; new milk is supplied for a month, during which period it is kept warm in pen; next, for three or four weeks, boiled skim-milk is given; and, to prevent the milk being burnt, the copper vessel is suspended in a copper of water; then one-third boiled linseed and two-thirds oatmeal, commencing with 1 pound of the mixture daily, are mixed hot with skimmed milk. All this time the calf is taught to eat sweet hay and a little linseed cake, and with each change of food the calves are removed to more airy quarters, which also allow of more exercise. In the spring and summer of the first year the calves do not go out; the winter calves are run on grass, and have a capital shed to shelter in at night. The great secret of success is the judicious change of food and quarters, according to the age and strength of the animal, by which steady progress is insured, the cake being continued. The heifers run out in summer and winter, coming into a well-sheltered yard at night in winter. They calve down at two years of age, and remain at the farm till they reach their prime, *i. e.*, coming down with third calf, when they are sent to the before-mentioned farm. The stock in August, 1883, consisted of 31 cows and heifers, in milk or about to calve; 18 yearling heifers, fifteen to twenty-one months old, for calving the following spring; 19 winter calves, mixed, eight to ten months old; 10 Shorthorn calves, three to six months old; 13 Shorthorn calves, under three months; and 1 yearling bull.

The winter's average yield of milk was, at the first-mentioned farm, where the animals in most profit are kept, about 9 quarts, and at the latter about 7 quarts, giving an average of 8 quarts. In summer the result was higher, viz, 11 quarts and 10 quarts respectively, giving an average of 10½ quarts. Assuming that the average is 9 quarts a day for nine months in the year, we have, at 10 pence a gallon, a gross return per cow of over £25, which for the liberal mode of feeding pays well. East Park is well sheltered by plantations, clumps of trees, and fine spreading timber.

Letting out cows to laborers.—One other branch of Mr. Turnbull's enterprise must be noted, which has been pursued since 1876, and this is the letting out of cows to laborers. The experiment was commenced with Kerry cows, of whose valuable dairy properties Mr. Turnbull had satisfied himself during a visit to Killarney. These were succeeded by Ayrshires. The rate of hire is regulated by the cost of the cow, one-fourth of the cost being the average rate obtained. The cows are supplied when near calving. The contract is for a year, and the money is paid in advance, a plan which insures due care of the cow, as, although the loss of the animal is borne by the owner, the loss of produce falls on the hirer. As an evidence of the care that is taken of the animals, Mr. Turnbull states that, having let out 150 cows in the seven years of this business, only one cow was lost in calving, and the first animal let is still in service. The opportunity of getting the calf and the produce on such terms has been largely appreciated. Mr. Turnbull estimates the annual cost of keeping an Ayrshire cow on these conditions as follows: Hire, £5; summer keep, £5; winter keep, £8 10*s*; total £18 10*s*. A fairly good cow is considered to yield 2,200 quarts. Taking this at 3*d*. per quart, and the calf at 20*s*., though the present value if by a Shorthorn bull would be more than double that sum, the value of produce is £28 10*s*., leaving a profit of £10, besides the great advantage of skim-milk for the children. After having been continued for three years the experiment was found to give a return of 5 per cent. interest on the capital invested, after paying all expenses of agency, and allowing for depreciation, fall of price, &c. The hiring commences with heifers about calving time, these being let at from 10*s*. to 20*s*. under the ordinary price, and frequently retained by the same hirer for some years.

(4) THE DEVON CATTLE.

The Devon cattle, as we find them now, are very different no doubt to what they were many years ago, but there is very little question that, even in their latter-day aspect, they exhibit many of the particular features, and, to a very large extent, much of the form which characterized the members of the aboriginal breed from which they sprung. They have been called into existence to fulfill a particular and in some respects peculiar purpose, and, as far as it is given to us to judge, they are not to be found wanting. The localities in which the breed is most common, the climate to which it is exposed, and the requirements of the men who profit by it always combine toward a certain end, and in the Devon cattle these influences have worked together with a most satisfactory result.

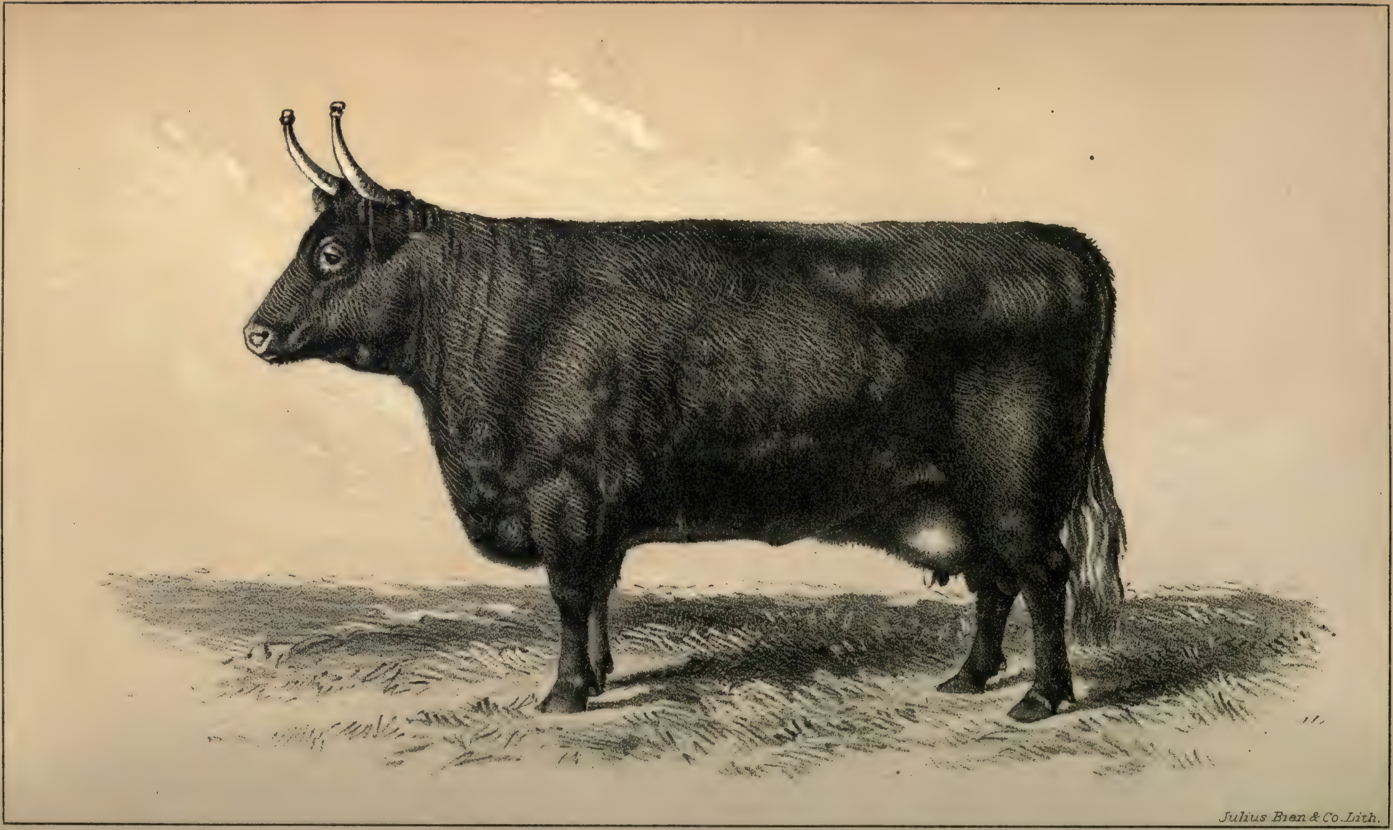
Points of Devons.—Devon cattle possess a distinctive type, but several varieties are placed under the title, and there is probably no breed in which individuals of almost precisely similar general aspect will, when scrutinized and analyzed carefully in their several features, exhibit more marked variations. In size they are medium, although it is much the custom to speak of "the little Devons." True, they do not possess the bulkiness of the Shorthorn or the Hereford; but, for all that, they are far from being a diminutive breed like the Ayrshires, the Kerries, or the Channel Isles cattle. The general aspect of the Devons is graceful, and their appearance seems to betoken a gentleness of mien which their looks do not belie. The head is small but the forehead comparatively broad, tapering off to a neat, clean-cut muzzle. The ears are thin and soft in texture, the eyes bright, and do not exemplify that dreamy look which many breeds have. They should be encircled by a ring of light coloring, almost approaching an orange hue.. The nose should be white. The horns are of medium length, graceful, and spread in an outward and upward direction, tapering easily off. In the male this feature is scarcely exemplified to the extent that it is in the female.

The outline of the Devon should not exhibit any very marked divergence from the shape of the proverbial parallelogram which should be realized in fat beasts. The neck is full but lengthy, and should show a good wedge-like form when regarded end on. The chest is deep and prominent; wide, fat loins, and a well-filled rump, where plenty of beef may be piled up, constitute one of its best points as a butcher's beast. The legs are fine, but well set on. The bone of the Devon is small, but the frame is, notwithstanding, comparatively speaking, large. Red is the color of the Devon, although a large number of the cattle in Devonshire display some white about them. The skin is fine and mottled.

Varieties of Devons.—Devon cattle may be grouped under three varieties, the North Devons, the South Hams, and the Devon proper, as exemplified in the accompanying illustration. The North Devons are the smaller and finer variety. Their coat is softer and more curly, and their general appearance more nearly warrants them being termed "the little Devons" than does either of the other two more distinctive varieties. The South Hams cattle—that is the cattle bred upon the fine uplands which lie between Dorset on the southeast, the sea on the south, and Cornwall on the southwest of Dartmoor, which forms the center highland of the county—are fine beasts, coarser in appearance and of bigger bulk than the North Devons. The Devons proper may be said to combine the most notable features of these two varieties. They are found mostly in the district around Taunton, and in Somersetshire and in Dorset, and are well represented, as a rule, at the Smithfield Club's show, where they are apparently the embodiment of the standard of excellence for Devons. Besides these, both Exmoor and Dartmoor, the latter particularly, can show a rougher type, smaller in size, and rather coarser in bone and flesh than can the other less exposed parts of the country.

Special characteristics.—The merits of the Devon are many. They are as profitable a meat-producing breed as any we have. Given so much food, the percentage of beef returned is as large as can be shown by any other breed. The beef is of prime quality, the offal proportionate, and the bone small. As fatteners they are not to be surpassed in their own

LIBRARY
OF THE
UNIVERSITY
OF
CALIFORNIA.



Julius Bien & Co. Lith.

MR. W. FARTHING'S DEVON COW "PRETTY FACE" country, and will go from store to fat beasts quickly on good pasture and a little artificial food. They require no severely expensive nor extensive course of fattening. As dairy cows they are more noted for the quality than the quantity of their produce, but it must not be supposed that the latter is small. As a rule, seeing the cream that is got from their milk, the quantity is comparatively large. One hears of great Jersey and Ayrshire records, but there is little doubt that were Devon records as persistently and carefully put before the public, they would take a high place in the ranks of our dairy breeds.

The illustration represents Mr. Farthing's cow Pretty Face, and gives a very good idea of the Devon in its proper form. The head is not quite what it should be. The horns project in too straightforward a direction and appear too parallel. But the neck is well shown, and the fineness of the frame, with, at the same time, medium, heavy build of buttock, is also evident.

Mr. Perry, of Alder, Lewdown, North Devon, says:

> I will not confine my remarks to strict data, but rest them rather on general natural laws and principles and broad results, because from the various and varying conditions which must be brought into play to produce the developed animal arising from different treatments and situations, strict or narrow data are often misleading rather than otherwise. In the first place, I hold that small as well as large sized animals are needed to turn our various cattle foods to the best account for the production of the best supply of animal food for the people. All producers cannot raise the foods required for the proper development of large-sized animals, nor are large-sized joints of meat suitable to all households. Again, small animals can be brought to perfection on pastures which will only keep large animals in store condition, and when fodder is scarce the small animals will pick their food in sufficient quantities, while the large animals will starve, and, if wanted for the market, the former can, in a few weeks, be fattened on concentrated foods before one's eyes, whereas a large animal must have its time. There is this, however, to be said of large-class animals: if their owners can keep them fattening from birth, they must, to have heavy weights at an early age, have growth.
>
> My conclusion is that an animal which is right in form, quality, and constitution is a first-class one, whether it be of a large or small size, and it therefore remains for those who have them to place them in suitable situations for foods and markets. I have often found my small-framed animals make me the most money, and my motto is to have an animal that will *swell* rather than grow into value. From fifty to sixty years ago Shorthorn cattle were introduced into Cornwall by a Mr. Peter, and they spread over a large part of the country, fixing themselves more particularly in the best districts. They also found their way into Devonshire and Somersetshire, where they have had rather an extensive hold, but of late, however, the Devons have been hedging them rather closely into the most fertile spots of the country, and many who were zealous advocates for them have either partially or wholly given them up. Herefords also found their way into Cornwall about the same time and were extensively kept in the eastern part of that county by a few other breeders farther west, but they have nearly disappeared from the east and are in few hands in the west of the county. They are no favorites with the butcher, having too much rank spine or fat, and killing hollow and deceptive in weights. The North Devons are now entering into the strongholds of the above breeds, and becoming the most general breed in the west of England. Their flesh is more marbly and mixed than the before-mentioned breeds, and their meat, as a rule, is of finer texture, more firm, and of superior flavor. They may be divided into two classes, the North Devon and the Somerset Devon. The former is a smaller animal than the latter, more handsome, and more easily fattened. They are particularly adapted for hilly districts, where they will frisk about with pleasure, and do well on short pastures, and, with a little indulgence for a few weeks, will be fit for the butcher, nothing in the way of beef selling at a higher price per pound. Animals of this breed that are fit for slaughtering at 5 cwt. may be made 8 cwt. or 9 cwt. with extra feeding.
>
> The Somerset Devon is a larger animal than the genuine North Devon, and from having been crossed with the latter sometimes grand animals are produced. As a specimen; for example, I may name Kidner's Islington champion prize ox. It is certainly important that the North Devon should be preserved, for then crosses may be taken as people wish, but if the pure race is lost it cannot be recalled and a cross-bred animal cannot be depended on to stamp its character on its offspring. The well-bred Devon is not, as a rule, a great milker, but the quality of the milk is rich and a pound of butter per day may be considered a good average. Well-bred animals are often

kept in the dairy, though they fail as milkers, simply on account of their value as breeders, but this is not the case with mongrels, for if they fail as milkers they are at once fattened. On this account mongrels are often stated to be better for the dairy than they really are. The Devon breed occupies, with but little exception, the whole of the district north of the forest of Dartmoor to the Bristol Channel, including the forest of Exmoor, and from West Somersetshire through Devonshire and Cornwall it holds the principal sway. I consider the fact of the Devon cattle again taking possession of the strongholds of the other breeds to be a broader and much more trustworthy fact as to merit than any test made (as I have before hinted) on a small scale. The Devons were first bred on the Government prison farm at Dartmoor, then the Ayrshires, then the Polled Scots, and now the Devons have again taken up the position they at first held.

Mr. Richard Bickle, of Bradstone, says:

My uncle has been a breeder of Devons for upwards of forty years and I still retain the same herd. I have always found them more profitable than any other breed, both for milk and aptitude to fatten. I can keep three Devons to two Shorthorns, and I find they will stand the winter and our wet climate far better than any cross or other pure-bred animals, and that without any housing or extra care. I have 125 bullocks, chiefly Devons, but I find the best bred ones are preferable to be kept, as they are always fit for anyone to look at. During the summer months I graze upwards of 100 besides my regular stock, and consequently I sometimes get a Shorthorn, Hereford, or cross-bred animal, but I invariably find it does me no good.

I have never tested the milking properties of the Devons, but they are not heavy milkers as a rule, although the cream is of the richest quality and will make more butter than that from almost any other breed. We never make cheese in our county, as it is not one for cheese making. The average weight of my cows with ordinary feeding would be about 7 cwt. of marketable beef, steers being about the same at 3 years of age. I have had some of the latter which weighed as much as 13 cwt. at 4 years old. Bulls in proportion weigh just the same.

The chief part of my farm is a light soil, with grey freestone, and the temperature is very changeable both in summer and winter. We have plenty of rain. As the district I live in is a grazing district the grasses used are of an ordinary character just for three years ley. The Devons in my immediate neighborhood are not used for draught purposes, but in the neighboring county of Cornwall I have heard of several being so used. My uncle had oxen in constant work many years ago, and they were considered better workers than any other breed. My young stock as a rule are housed about the beginning of November, but it depends partly on the mildness of the season. Store ones have an open shed all the winter.

Mr. Surridge, another breeder of the Devons, observes:

In speaking of the Devons it must be remembered that there are the Somerset Devon and North Devon breed. I have been breeding principally Somerset Devons. I have never kept an account of the average yield of milk, but some of the Devon cows give from 16 to 18 quarts per day and make from 1 pound to 1½ pounds of butter daily, and others give not more than half that quantity. The live weight of a Somerset Devon at four years of age reaches from 18 cwt. to 22 cwt., and my own bred bull Robin at 4 years old weighed 1 ton 56 pounds, and the dead weight was considered 80 score. The cows weigh from 12 cwt. to 17 cwt., live weight; oxen, from 15 cwt. to 20 cwt.; steers under two years old, 8 cwt. to 10 cwt.; steer under three years old, from 12 to 15 cwt., and steer under four years, from 13 to 17 cwt.

The grasses cultivated are Dutch, Alsyke, Trefoil, Italian, rye and clover. I myself cut some for hay; others cut some green for feeding in summer. If the animals are intended for exhibiting the system of housing pursued is to keep them in in summer and winter, giving them every day moderate exercise, and feeding them on different kinds of meal-cake root and green food. I commence handling and leading when my beasts are about three months old, but sometimes before. The dead weight of one of my animals (Norah 3d) was 144 stone 5 pounds, or 57 score 17 pounds, and her live weight 14 cwt. 1 quarter. The temperature on my farm is about 60° to 65° in summer and 45° to 50° in winter, and the soil in my neighborhood is chiefly ray and sand, some of which is very good and some very inferior.

(5) THE HEREFORD CATTLE.

Characteristics.—The chief points to be looked for in a good Hereford are, first, that the color should be a distinct red, not too dark or too light, white face, mane, breast, and belly, white end to tail, and white legs as far as the knee and hock, sometimes running up the flank.

The bull should have a good masculine head, not too long, broad between the eyes, which latter should be large and prominent, but with a mild look about them, denoting docility and equability of temper; the horns should be of moderate length, springing straight from the head. The cow's head should be much the same, but finer, should have a mane, and her horns turn upward slightly; they should be in both cases of a foxy white, although occasionally they are found tipped with black. The nose should be a pure white or flesh-color. The bull should have a good rise of crest, deep-sloping shoulders, well-developed brisket, straight back and belly line, wide loin, good springing ribs, moderately broad hips, tail well set on and falling in a plumb line to the hocks; the hind quarters should be long from the hip back; the thighs, which are a very important point, should be large and full, showing plenty of width across when you stand behind, and should be well meated to the hocks. The whole carcass should be set square on good short legs standing well apart, and be covered with firm flesh of good quality, and a mellow hide of soft but not too fine hair, giving the impression, when you touch it, that it will stretch to any extent; but the test of "touch" is extremely difficult to explain in words, and it can only be learned by practice.

History of the Hereford.—There can be no two opinions on the question of what Hereford cattle are; they are most undoubtedly a distinct and pure breed of great antiquity. Their early history is like that of many others, rather shrouded in mystery, but it is generally allowed that there has been a breed of cattle, red and mostly with white face and markings, for at least two hundred years in the county of Hereford and the neighboring counties. When crossed with other breeds the potency of the Hereford blood (pure for centuries) is distinctly proved, as it is an exception for any calves to come any other color than the red with white face. This has come true from Hereford bulls on black Welch cattle, Ayrshire, and Shorthorns; again, if a Shorthorn bull is put to a Hereford cow the produce usually follows the dam in color, and cases have been seen where the produce of the Hereford bull with the black cattle come black, but still they have had the correct Hereford marking as regards the white face and legs.

Valuable qualities of the Herefords.—Their milking properties have been so long neglected in the interest of beef, that they are usually not deep milkers, but give very rich milk. In all cases a cow should be milked regularly and stripped quite clean. No doubt this has much to do in forming good milking tribes of cattle, by encouraging the milk-giving organs as far as possible. Where calves are allowed to suck in the open field this cannot be attained, and is one great cause of the Herefords not giving so much milk as they would under other circumstances. As beef makers they are quite at the top of the market, as market quotations record best Scot and Herefords as being usually quoted together. The calves are usually allowed to run with their dams during the summer, and this gives them a good start, but it is too often lost sight of that they should be kept growing on when weaned, instead of stunted during the winter and following months.

The Hereford fairs have long been noted for bringing together the best collection of bullocks in England, and are attended by dealers and grazers from far and wide, as they are highly valued in our great grazing districts.

Breeders of Herefords claim for their favorites that they are among the most hardy of all breeds of cattle, can be fed on less meat, and thrive on coarse rough food, and thus are particularly adapted for countries where it is impossible to take special care of the cattle through bad seasons and winter months.

Herefords, except in a few instances, have been bred entirely for beef. One great object of breeders is to have their animals as wide on their chine as possible, so as to carry good full crops when fat, and no cow will milk deeply unless it is made like a wedge—the lighter neck and forepart the better. If attention were paid to the Hereford as it has been to the Shorthorn, they could be trained to milk well and deeply, and the richness of the milk is not gainsaid; but whether they would excel the Shorthorns or become equal to the best of them it is difficult to say, nor do I think it worth while for breeders to try; at all events so thinks another Hereford man. They stand first and foremost as a beef-producing race, and perhaps it is as well they should for the present take their stand on that, but if any breeders fancy taking up the milk line, they will probably in a great measure succeed.

Herefords for crossing.—A celebrated breeder of Herefords in England recently addressed the following queries to a gentleman who had tried the cross of a Hereford bull on Shorthorn dairy cows for several years:

1. Of calves got by a Shorthorn bull or by a Hereford bull, which fatten the quickest and which are the most valuable if sold fat to butcher? 2. Of heifers got by a Shorthorn or Hereford bull, which do you consider the best for milk, having regard both to quantity and quality, and in quality both as regards cheese and butter? 3. As to the produce generally got by a Shorthorn or Hereford bull, do you find any difference as to their gain of flesh or ability to thrive both at grass and in yards; and, if so, state fully your views thereon? 4. Do you find any difference of size in the produce; and, if so, which are the largest animals—the Shorthorns or those the result of the cross with the Hereford bulls? 5. Do you think there is any difference as to hardness or as to liability to disease between the Shorthorns and the animals resulting from the cross with the Hereford bull; and, if so, to which do you give the preference? 6. Does the offspring of the cross with a Hereford bull generally follow the marking of the sire or of the Shorthorn dam?

The following were the replies received:

1. I consider those got by a Hereford bull. 2. Heifers got by a Hereford bull are, I consider, equal to the pure-bred Shorthorn for the production of milk, both as regards quantity and quality. 3. My experience tells me that produce got by a Hereford bull out of a Shorthorn cow feeds quicker both on grass and when put up to feed. 4. Produce obtained by the cross, as mentioned in No. 3 (viz, by a Hereford bull), is the larger of the two. 5. Undoubtedly the produce obtained by using the Hereford bull is the hardier and has my preference. 6. I find that the offspring obtained by the cross with the Hereford bull follows the sire in color in five cases out of seven.

The writer adds as follows:

Having some three years ago bought some Hereford cattle from you, I think you might like to know that they have done remarkably well, though I find it takes a long time to make a name as a Hereford breeder. At the same time that I bought the Herefords from you I purchased ten Yorkshire dairy cows—Shorthorns—from Mr. Gothorp, near Bedale, in Yorkshire, and after these cows had calved I determined to try a cross of the two breeds, which I did by using the Hereford bull I bought from you on the Shorthorn cows. The result was beyond my expectation. I reared the calves on skim-milk, &c.; they had a little cake till they were six months old, when they took their luck. At eighteen months old I gave them 4 pounds each per day when grazing (this would be in September). On the 12th October I put them up to feed, giving them 8 pounds of cotton-cake and linseed-cake mixed, and 6 pounds of meal with pulp each per day. The week before Christmas I sold two of them, averaging £21 10*s*. each, and also some Shorthorn bullocks (which I had also bought from Mr. Gothorp). These latter were three months older, and only realized £19 15*s*. per head, though similarly fed. In the second week of January I sold some more of the cross-bred bullocks (they were then twenty-three months old), and they averaged £24 5*s*. 6*d*. per head, and the remaining Shorthorn bullocks averaged £22 17*s*. per head, being, as the others, three months older. I certainly am of opinion that the bullock obtained by this cross is better than the pure-bred Shorthorn for the quick production of beef. I have also some heifers of this cross about to calve, and they carry plenty of flesh, and promise to make equally as good milkers as their dams. I consider the result of the cross satisfactory, especially on this poor, cold clay soil, the grass of which (as you know) will not feed a mouse.

As to their milking qualities, says a tenant farmer, no doubt breeders have neglected them almost entirely, as it is the usual custom to rear the calves on the cows, and beef, not dairy produce, is, as a rule, the end aimed at. This is, however, true in a great degree of other breeds when the best tribes are kept for breeding purposes, and it is a question whether a Hereford does not give as much milk, and perhaps even of a richer quality, than the crack tribes of other breeds, excepting thoss bred especially for milking purposes. There are few Hereford dairies kept, but from my own experience I believe, by selection, that a grand milking herd could soon be established. No one will, who has tried the experiment, agree to the statement that the Herefords do not cross well with other breeds. The Americans have found it out, and now assert that they can sell their Hereford grade steers for more money than those of other crosses. It may be true that they have not been very extensively tried, but the experiments that have been tried will soon "get wind"; in fact they have already, and the demand is entirely increasing in consequence.

One great proof of the Hereford being a pure and distinct race is that, although crossed with whatever breed may be desired, the true Hereford marking is sure to show itself; and if an animal has only a quarter strain of blood, the Hereford marking is still there. The great object in America now is to improve the cattle as beef producers, and to put the good roasting pieces on the narrow-chined, bad-backed cattle of the plains; this they believe, and rightly too, the cross with the Hereford will do. Another great point in favor of the cross is the power of the Hereford to endure knocking about and rough usage better than more delicate cattle, and this is of the very greatest importance when considering the vast distances the cattle have to travel through America, and by sea, before they reach this country as beef.

A recent purchaser of a large herd of Herefords in this country writes that they had a very rough passage out, and the hatches had to be all battened down, but he had no losses, and all arrived in capital condition, none the worse for their knocking about. He could only account for this from the fact that this breed of cattle could stand such usage better than others or he should have had serious loss. As to their not feeding so well in stalls or attaining such great weights there is proof from many trials, and from Smithfield statistics, that they are little behind, if not equal to any other known breed of cattle.

Says another authority:

> The Shorthorn has no quality superior to that which the Hereford possesses; if it has, let it be fairly shown. Take each point in order: Both breeds have been well tried, both as graziers and feeders. It is acknowledged that the Hereford is the best grazer, and it is asserted in this country and America that four Herefords can be fed on the same meat as three Shorthorns. There is evidence to show that the milking quality of the Hereford is as good as the high-class Shorthorn, and their milk is much richer. The London market bears testimony to the superiority of the Hereford meat by always quoting it in advance of the Shorthorn. Their early maturity and weight for age has been tested again and again, and there is little difference in either breed. The merit of the Hereford for crossing purposes has been disputed, but now it is an indisputable fact that they are fast gaining ground in the good opinion of grazers. A great many bulls are now sold to dairy farmers to cross with their Shorthorn cows, as they say they can get their calves ready so much more quickly for the butcher, and if kept on for bullocks they beat the ordinary run of Shorthorns in aptitude to fatten and in quality. To mention a few instances: Eight Hereford grade steers were put up to feed, and sixty Shorthorn grades were picked out of a six hundred lot, and then the best of the eight and the best of the sixty were killed as a beef test. A large cattle-breeder used nothing but Shorthorn bulls to three hundred cows, and could only make some £3 or £4 of his grade yearling bulls. The same man now, by using Hereford bulls to the same cows, has sold his yearling bulls at £15 each.

Again, another farmer, who used to make £6 each of his grade Shorthorn heifers, makes £16 each off his grade Herefords at the same age. The fact that these men are no breeding enthusiasts, but practical American beef-producing farmers, goes a long way to show the turn things are taking in that country.

Weight and value of Hereford cattle.—At the last Smithfield show, Hereford steers in the class under two weighed, first prize, 13¾ cwt., twenty-two months; second prize, 14 cwt., twenty-three and one-half months; and third prize nearly as high. The weights were tolerably even in all the classes. In steers under three, first prize was 17 cwt., at two years seven and one-half months; second prize, 16¼ cwt., at two years eight months. In the class under four, first prize weighed 17¾ cwt., at three years eight months; second prize, 18½ cwt., at three years four months. In heifers, first prize weighed 14¾ cwt., at three and one-half years; second prize weighed 17 cwt., at three years two months. The winning cow was 20¾ cwt., at eleven and one-third years.

No particulars of value can be obtained as to the performances of pure Herefords in milk, butter, or cheese. It is not used for draft of any kind, and it is chiefly bred in the west of England, Herefordshire, and Worcestershire, although many successful breeders are scattered throughout the country upon all soils. Herefords are driven to all the great midland fairs for farmers, who purchase them largely for fattening. The chief grasses grown are clovers, vetches, and the best perennials. That the Herefords will do well on heavy as well as light land is now admitted. We can point to cases within our own knowledge where at the Christmas markets Herefords brought in to fatten have beaten everything else in realizing top prizes, although in a county where they are comparatively little known.

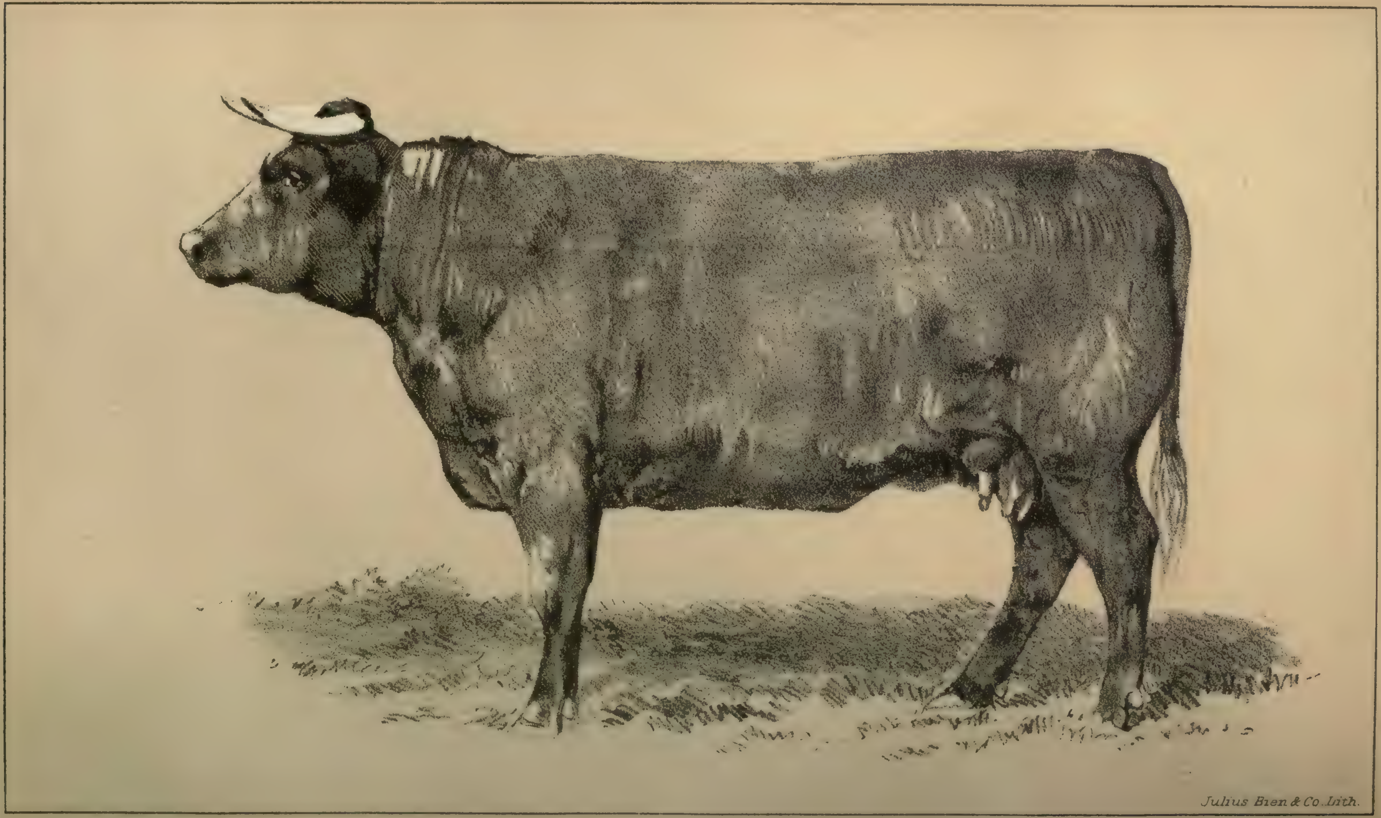
Milking qualities of the Herefords.—The milking qualities of the Herefords have no doubt been seriously neglected in the past, and are similarly treated by breeders generally at present; but there is no reason for doubting that as milkers the existing herds show a very considerable improvement. As a rule the Hereford cows, when contrasted with extremely large bulls and oxen, are somewhat small, but is, of course, in no way small as we apply this term to Kerries, Ayrshires, or Channel Islands cattle. The cause of the undevelopment of good milking qualities in all Hereford herds is not far to seek. The soil of the locality which saw the breed originate is admittedly not suited to dairy cattle, consequently there is not that attention given to the improvement of the herds as milkers as would be the case were they in a district better suited to further their dairy properties. In its original habitat the custom which prevails is to regard the steers as the source of pecuniary profit, and whereas in most other parts it is the general practice to give the females the preference in rearing, it is much more usual for both male and female Hereford calves to be similarly treated, the preference being given to the males. This practice largely obtaining is obviously calculated to prove detrimental to milking properties. The outcome of all this is that, as a rule, the Hereford is wanting in dairy qualifications. But, on the other hand, the exception does not strengthen the rule, even if it proves it, for where pure bred Hereford stock is kept purposely for dairy requirements, where the good milkers are kept, and the bad and indifferent are weeded out, it is soon very obvious to the most prejudiced that high milking qualities are resident in the Hereford.

(6) SUSSEX CATTLE.

Mr. Forster, of Otham, Kent, a well-known breeder, says:

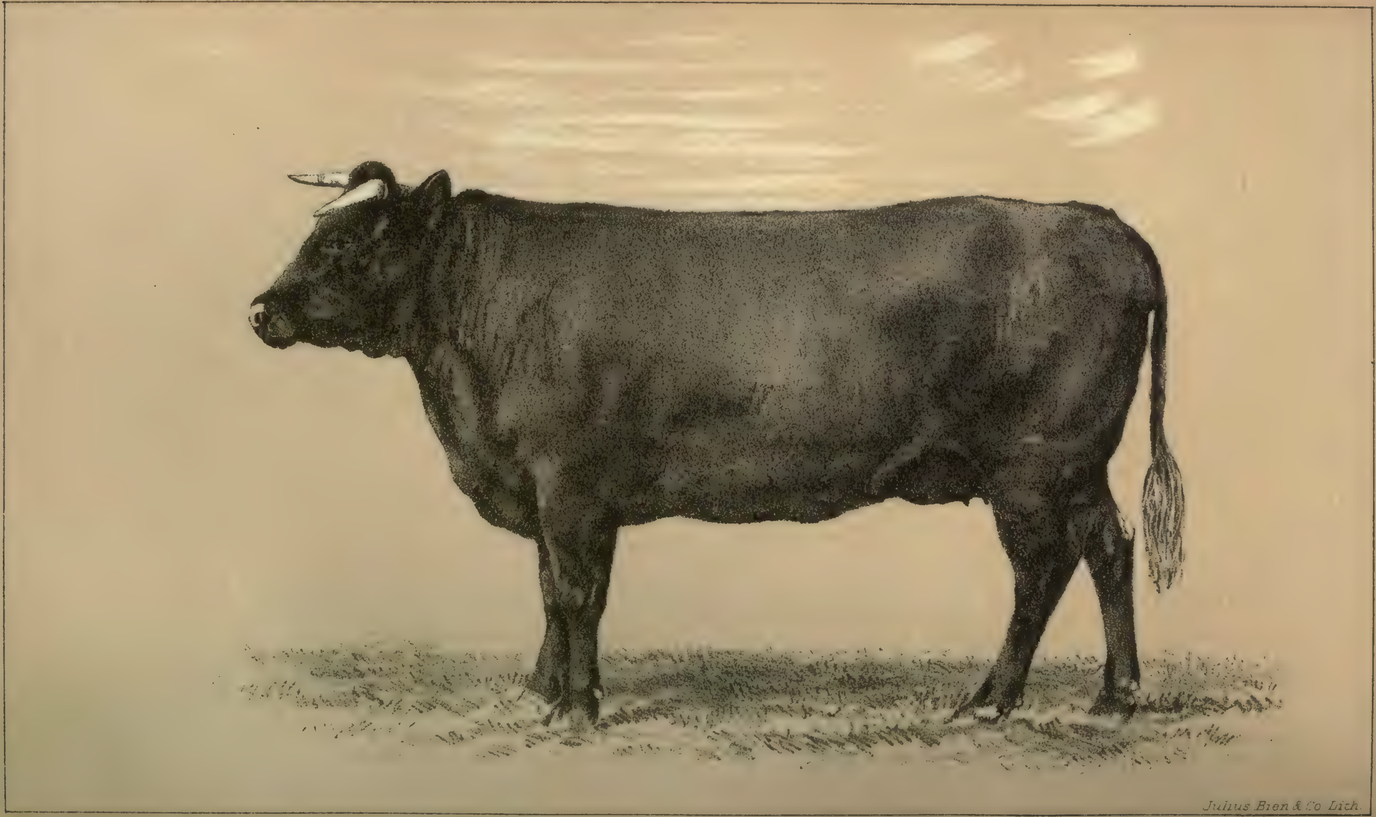
The Sussex, as a rule, are very poor milkers, giving scarcely, if ever, sufficient to rear their own calves, and are worse butter-makers. Their weight, of course, differs

PLATE 12


Julius Bien & Co. Lith.

MESSRS J & H. HEASMANS SUSSEX COW

FIRST PRIZE AT TUNBRIDGE WELLS



Julius Bien & Co Lith.

MR. J. S. HODGSON'S SUSSEX HEIFER.

SECOND PRIZE AT TUNBRIDGE WE

according to the system of feeding. A Sussex heifer last Christmas, which I exhibited, under the age of four years, showed a weight of 148 stone of 8 pounds to the stone, and a steer exhibited last year, aged two years and eleven months, weighed 196 stone. These were specially fattened for exhibiting, but, as a rule, steers killed under three years and fattened in the usual way would scale from 90 to 112 stone. They require good loamy soil, and the better the grass the earlier they can be made to reach the butcher. It is a great thing to keep all young stock well from birth, housing warmly and feeding them liberally with a little linseed-cake and cracked corn from weaning time. The steers are used very little for draft purposes.

With regard to the housing of the Sussex, one must be guided by the accommodation which his farm buildings afford, but at all events young beasts should be kept warmly housed. I use for feeding, in addition to what I have referred to above, a mixture of oil-cake and corn, and a few roots are advisable. As to breeding, this is a great secret. Ascertain the weak points of a cow, and, if possible, counteract them by selecting a bull perfect in the deficiencies of the other. I think more depends on the selection of a good bull than anything else, and I do not consider any price too exorbitant for a perfect, good colored and constituted animal.

Mr. Page, another large breeder, says:

The Sussex cattle, as a rule, are bad milkers, but capital flesh-makers, and if well-bred, make it up quickly. I seldom keep them for milking, but bring up calves with them. The following are the measurements and weights of a few Christmas beasts which were shown at Islington and took prizes:

Sussex heifer, three years old, 7 feet 8 inches by 4 feet 9 inches = 55 score. Live weight 15 cwt., 1 quarter.

Sussex heifer, 1 year 11 months, 7 feet 7 inches by 4 feet 8 inches = 52 score. Live weight 14 cwt., 3 quarters.

Sussex steer, 1 year 11 months, 7 feet 4 inches by 4 feet 4 inches = 46 score. Live weight 12 cwt., 3 quarters.

At the above show, in December, 1883, the first prize steer, twenty-one months, weighed 11¼ cwt.; the second prize, twenty-two and a half months, 13½ cwt. The first-prize steer, two years eleven and three-quarter months, weighed 19 cwt.; the second prize, two years seven and a half months, 14 cwt. The first prize steer, three years eight and one-quarter months, was 18¾ cwt.; the second prize, three years nine and three-quarters months, 20¼ cwt. The first prize heifer, three years and one-quarter month, scaled 16¼ cwt.; the second prize, three years two months, 14¾ cwt. The first prize cow, five years eight months, weighed 14 cwt.; the second prize, six and three-quarter years, 15¾ cwt. The Sussex beast is a very large-framed red beast, entirely whole-colored, and rather higher on the legs than the Devon. Although it is so largely grazed upon the Sussex Downs, the breeders prefer the hair to be long and silky, these generally having a mellower skin and feed better. In the majority of cases it is the custom to work the steers from three years old until they are six or seven, when they are generally put up to fatten, which they do rapidly. The heifers are seldom bred from until they are two and a quarter years, producing their first calf at three years. In working, all the oxen are kept in good condition, for if too low it is most difficult to bring them back to a fleshy state afterwards.

The points of the Sussex are as follows: Eye rather prominent; wide across the forehead; neck medium in length and cleanly made under, with a small dewlap, the top part of which is straight to the head. The nose is rather wide and thin between the nostril and the eye, the tops of the plate bones are not overwide, the sides straight and without any projection at the shoulder point; the breast is wide and projecting forward; straight fore-legs, bone rather fine, medium in length; back straight behind the shoulder-blades and with the hollowness which is generally seen when the blades are wide; body very round, with a straight chine; broad ribs, decidedly narrow between the first rib and the hip bone; loin flat and nearly as wide at the fore as at the hind end, each side lying on a level with the chine, and almost parallel—if the ribs are well sprung this will generally be the case; hip bones broad, with a wide space between, and lying nearly as high as the chine; the rump should be long and flat and wide at the setting on of the tail; the tail should drop exactly between the tip of the rump and what is generally known as the first touch; the outside of the thigh is flat, without fullness behind.

In breeding, the calf is seldom allowed to take all the milk of the cow, which is taken from it all day. It is allowed to suck two of the teats after the milkmaid has drawn the other two, getting in addition to this a small quantity of bran or ground oats, which is left for it in a small trough. At a month old it is usually allowed to run with her throughout the day, but is taken from her for the night. A portion of the morning's milk is then taken and the calf allowed the remainder. This is the general practice until the calf is weaned. It is then fed upon cut grass, clover, hay, and bran until it is turned out upon the pasture, when the meal feeding is increased until the following winter, when it takes its place among other yearlings in the yard and is allowed to browse upon the various products of the farm, getting a certain allowance of roots, meal, and cake each day.

In Sussex the oxen are generally worked with a double yoke until they attain their full growth, at 6 years. As the ox is a slow mover, it is injurious to drive him too fast, and this is the case with the Sussex. When first yoked, steers should be kindly treated and worked an hour or two only in the day with steady older beast, that they may be gradually broken into the work. Those working together should be of equal strength and height, otherwise the weaker animal will do more than his share, and, perhaps, tax his strength too far. The weaker beast may have an advantage given it, if such is required, by slightly altering the chain of the yoke. In hot weather Sussex cattle must not be driven too hard or the constitution will be affected.

The following is an old system in Sussex for working cattle in succession: To bring 8 steers into work each year, it is necessary to save 16 calves, 10 males and 6 females. Eight of the best steer calves should be brought into work when three years old, and the remaining 2 may be turned off to fatten. The 6 heifers may each produce a calf at three years old, when the breeder should select 4 of his best heifers to put into his dairy, and the other 2 be sold or turned off to fatten when they have reared their calves. By this means a team of 24 working oxen and a dairy of 20 cows may be kept up. Thus, 8 three years old, 8 four years old, 8 five years old. As these arrive in succession at six years old 8 will be turned off the team, either for sale or grazing on the farm; when 8 three-year-old steers will be brought into the team to supply their places.

Experiments have been made to test the advantages of yokes or collars, and it has been pretty conclusively shown that the Sussex yoke is the best system known. In one trial between 6 beasts yoked and 4 in collars there were but three minutes' difference in an acre, which was well ploughed in 4 hours and 10 minutes. Stall-feeding is practised in some cases in Sussex, when a manger, water-trough, and fodder-rack are provided. One gentleman gives his working oxen 2 bushels of chaffed oats straw daily, with 3 gallons of barley or beans and bran mixed. Sometimes barley or pollard is used instead of the beans or bran, and when potatoes are given, which is sometimes the case, a portion of the corn is knocked off. Hay is seldom given except the beasts are at work, and then only as a bait. In fattening these beasts this gentleman gave the same quantity of chaff and just double the quantity of the other foods. His beasts are fed twice a day and the chaff is steamed. The cows in the winter time are also largely fed on oat-straw, with bran and potatoes, but in summer dairy cows get no corn at all.

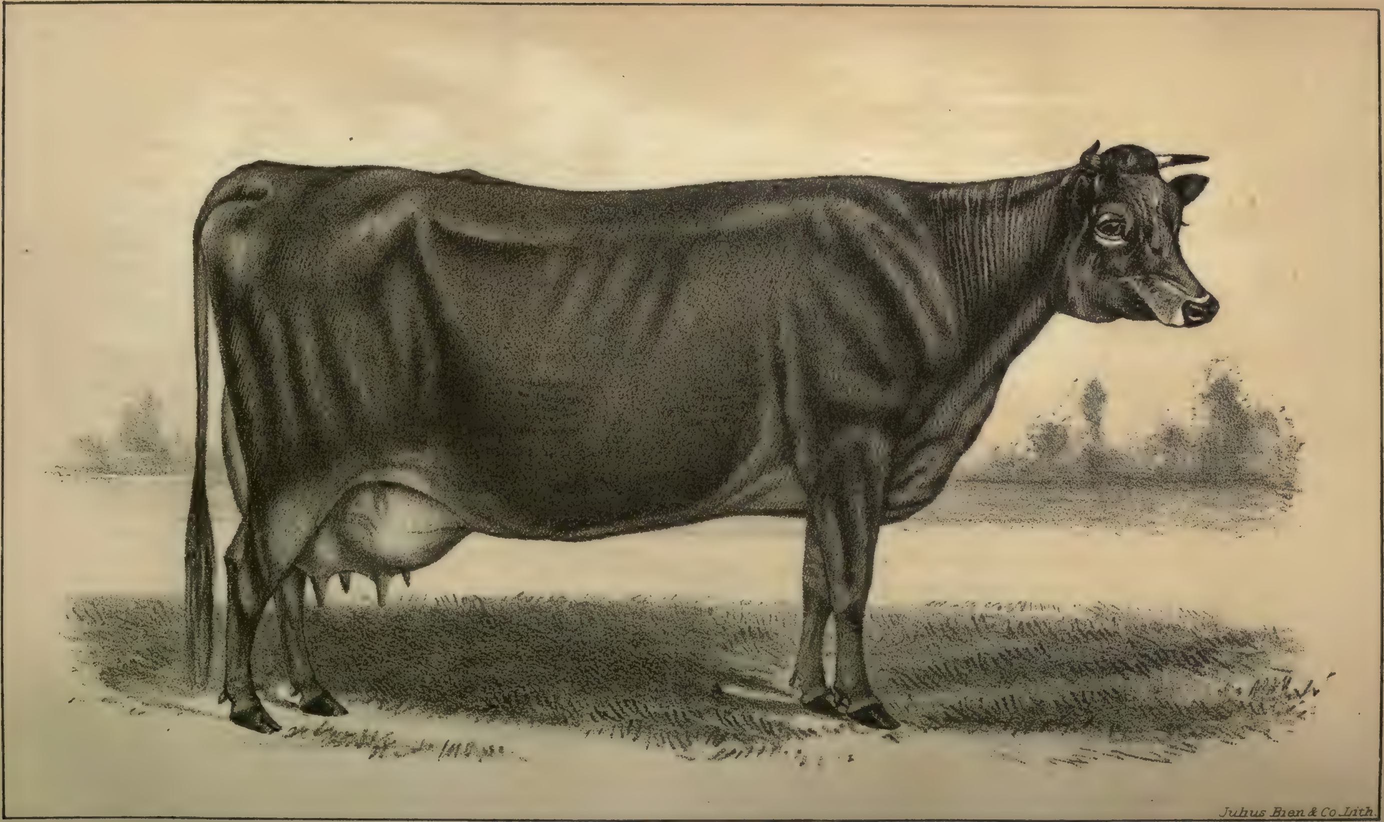
(7) JERSEY CATTLE.

The following are the points of Jersey cattle as established by the Jersey Agricultural Society:

The cow and purity of breed.—On both parents' side reputed for producing rich, yellow butter—four points; head small, fine, and tapering; eye full and lively; face lean and of a smoky color; muzzle fine and encircled with white; horns polished, a little crumpled, tipped with black; ears small and of an orange color within; back straight from the withers to the setting of the tail; chest deep, and nearly on a line with the belly—four points; hide thin, movable, but not too loose, well covered with soft hair of good color, two points; barrel-hooped and deep well-ribbed home, having but little space been the ribs and hips; tail fine, hanging 2 inches below the hock—four points; fore legs straight and fine; thighs full and long, close together when viewed from behind; hind legs short, the bones rather fine; hocks small, not to cross in walking—two points; udder full, well up behind; teats large and equally placed, being wide apart, with veins large and swelling—four points; growth, one point; general appearance two points; perfection for cows and heifers, thirty-one points.

The bull.—The points desirable in the female are generally so with the male, but must, of course, be attended by that masculine character which is inseparable from a strong and vigorous constitution. Even a certain degree of coarseness is admissible, but then it must be so exclusively of a masculine description as never to be discovered in the females of his get. In contradistinction to the cow, the head of the bull may be shorter, the frontal bone broader, and the occipital flat and

PLATE 14


Julius Bien & Co. Lith.

A JERSEY COW

stronger, that it may receive and sustain the horn, and this latter may be excused if a little heavy at the base, provided its upward form, its quality and color, be right. Neither is the looseness of the skin attached to and depending from the under jaw to be deemed other than a feature of the sex, provided it is not extended beyond the bone, but leaves the gullet and throat clean and free from dewlap. The upper portion of the neck should be full and muscular, for it is an indication of strength, power, and constitution. The spine should be strong, the bones of the loin long and broad, and the whole muscular system wide and thoroughly developed over the entire frame.

Origin and improvement of the Jerseys.—Mr. Jonathan Smith, Jersey, says:

> Our breed of cattle was originally the same as that of Normandy, of which Jersey forms a part, and with which it was once physically connected. Tradition says it was severed from the mainland about the same time (possibly by the very same tremendous irruption) when the sea swept over the pleasant fields of Eastern Kent and buried them forever under "the Downs," leaving no trace of what once had been, save the shifting Goodwin Sands. The effects of this disruption, so far as Jersey is concerned, are in every way most interesting. The mainland of Normandy has lost everything but the name; her too-powerful neighbor, France, has robbed her of her independence, her laws, and even her language; and the ancient home of our kings has for centuries been a province of France. But for the strip of silver sea, such must have been the fate of Jersey. As it is, she has successfully repelled all attempts to conquer her, and has remained faithful to her ancient rulers. She is still governed by the very laws which her Duke William introduced into England at the Conquest, and her mother tongue is that which the Conqueror spake himself.
>
> The "Romance de Rou," written by our Jersey poet Wace, for Henry II, in the twelfth century, is still the language of our farmers, though unintelligible to the Parisian of to-day. Jersey has the same forms of self-government, the same land tenure, the same laws and language, the same manners, customs, and habits that she had 800 years ago. And so with her cattle. The silver streak separating Jersey from the continent converted it into one great farm, with the sea for its ring fence; and the same conservative spirit has been effectual in keeping the breed pure from any foreign taint. Jersey has thus enjoyed for centuries the very happiest conditions for producing a distinct and excellent breed of cattle, to which must be added the advantages of her climate, equally free from arctic cold and burning heat, which permits her cattle to be outpastured almost every day in the year and keeps her fields perennially green. These favorable conditions have been put to advantage. The original stock, the Normandy breed, has long been (and still is) famous for its butter qualities. These have been steadily and perseveringly developed by our farmers, who have persistently bred for that single object; and the Jersey has been brought to its present perfection by simply following out this one idea—butter! Hence it has been the invariable custom for ages never to use a bull before seeing his dam and being satisfied as to her yield of butter. Unless this proved satisfactory, no other point in the bull himself or his dam availed anything; nobody would use him. This idea still governs the vast majority of our island breeders and those of America, and doubtless still greater triumphs await them in the udders of the future.
>
> It is much to be regretted that of late years some English breeders have taken upon themselves to set up a new standard—solid color; that is, the absence of white markings in the coat—which has absolutely no foundation at all but the oddest caprice. It is neither a peculiarity of the breed nor a sign of purity of race, nor of any other quality whatever, bad or good; it is simply a blind alley leading nowhere. The single aim and end of our efforts has hitherto been butter, and it is this concentration of the energies of all our breeders in one direction for so long a period which has doubtless been the chief agent in improving the breed and making it what it now is—the best of butter cows. Let us hand down the breed to our children at the least not worse than we found it.
>
> Besides the steady pursuit of one object for so many generations, and the careful selection of sires to that end, there are two other peculiarities of management in Jersey—tethering the cows and feeding the calves by hand.
>
> *Tethering cattle in Jersey.*—This doubtless originated as a matter of necessity, and has since been continued for its economy. Owing to the small size of Jersey farms, which are constantly divided at the death of the owner among his children, and the necessity each farmer felt, in the olden time, to raise as far as possible all the necessaries of life for himself, each farm had its patches of wheat, turnips, grass, cabbages, &c., growing side by side, often all in the same field. Hence the necessity of confining

the cow in some way to keep her from damaging the allotment—like crops. The Belgians, whose farms are of the same small allotment type, have met the same difficulty in a different way; they keep their cows shut up, and carry them all their fodder. The Jersey method is more natural and wholesome, less laborious, and has produced better results. It has originated a new type, the best butter cow in the world, unique also in gentleness and beauty. The advantages we claim for tethering are:

(*a*) Economy of food.—Some good judges have put this as high as 50 per cent. They assert that three tethered cows may be kept where otherwise two could only be kept. But no one in Jersey is willing to put it lower than one-third; where three only could find pasture loose, one may increase his stock one-third and keep four cows if he tethers them. The grass is eaten up clean, fine and coarse alike; none is left and none spoiled.

(*b*) The feed is regular and equal. The cow is not pampered one day and starved the next; its appetite is not spoiled, nor its digestion deranged.

(*c*) It gives perfect command of the food supply. A cow can have much or little, a long tether or a short one; it can be confined to a poor corner or favored with the fat of the land, as may be necessary or desirable.

(*d*) It saves fences and economizes food that would otherwise be wasted, from the impossibility of letting in a loose cow to graze it.

(*e*) The cow is more gentle. Its keeper is its good genius, on whom it is constantly dependent for all it wants. Its docility (and affection even) follows as a matter of course.

(*f*) It is doubtless to the tether that our Jersey cows are indebted for their exquisite fineness of limb, their airy grace, and general elegance of proportions and appearance.

(*g*) More butter is obtained. Nothing is so destructive to animal fat, whether on the flesh or in the udder, as motion and exercise. This is so well known as to be proverbial, yet how often is it overlooked. The same farmer who fats his bullocks quietly in a stall will give his cows the run of a large pasture, as if they were in training for a race.

Rearing calves by hand in Jersey.—Much importance is attached to this practice in Jersey. The calf is never allowed to suck at all, and has, therefore, never to be weaned. The rearer has perfect command of the calf's food and can vary it as needed. Like tethering, it increases the animal's docility and its attachment to its attendant, on whom it has to depend from the very first. The effect on the cow is equally good. Having never suckled her calf, she does not fret when it is taken from her. More important still, having never yielded her milk in any way but to the gentle persuasion of the milkmaid's hand, she is not tempted to withhold it.

Milk vs. butter yield.—Mr. Walker says:

While cows giving exceptionally large quantities of milk will sometimes make large butter tests, as a rule the two things do not go together; they are inconsistent with each other. Breeding for quantity of milk is sure to depreciate the quality and reduce the butter yield. It is the opinion of many of the most skilful breeders of Jersey, and those of longest experience, that by judicious selection of individuals from particular families it would be far easier to carry the milk yield of a family of Jerseys from an annual average yield of 6 quarts of milk per day up to 12 quarts per day than it would be to carry an annual daily average yield of butter from 12 ounces up to 18 ounces per day. That is to say, it would take a less number of generations from the cows with which the breeder started to double the flow of milk of a family than to increase their butter yield by one-half. In other words, it is a problem of far more difficulty to increase the butter yield of cows than to increase their milk yield. Every careful observer knows that the number of quarts a cow is giving will fall off very considerably without materially reducing the pounds of butter she will make.

It has taken centuries to produce the richness of milk of the Jersey cows. It has been done and is being done against the ordinary workings of the laws of nature. It is against natural laws that the milk from a cow should be so rich as to kill her calf, and the struggle of nature is to reduce the richness by increasing the quantity; therefore the breeder must never attempt to increase his butter yield by coupling an animal from a family yielding a large quantity of milk of poor quality with those giving rich milk in less quantity. The result, as a rule, must, in the nature of things, be the opposite of that which the breeder seeks. The only way to maintain, to say nothing of increasing, the butter product of any family that is making exceptionally large yields of butter, is to couple those animals that spring from the very best specimens in the same family, when not already in-bred too far, and of the very best proved outcross, when out-crossing is desirable.

The thing to be done with the Jerseys giving large quantities of milk of inferior quality is to abandon them to milkmen, whose only object is quantity of milk, not quality. They have a keen eye for large milkers among Jerseys, as every one knows who owns Jerseys, or who buys Jersey milk in any city or large town. Breed from the best butter families under all circumstances. Never fight against accomplished facts. He who fails to avail himself of all which his neighbors have accomplished in breeding, by neglect to use the blood that has been thoroughly developed, on the ground that he "probably now has as good," will disastrously fail in his undertakings. It is simply blind egotism that must inevitably meet its fate.

Treatment of Jersey calves.—Under this head each breeder would write a different treatise. No two probably agree, and while I claim no special fitness to discourse upon this topic, and therefore have no right to speak authoritatively, still, as I have some distinct notions upon the subject, I herewith submit them, hoping that by an interchange of views those methods that are the best may be made certain by a comparison of the experience of different breeders.

The milk of a very rich Jersey cow is far too rich for her calf. If she has a large flow immediately after calving, the calf will only take a portion, and that the poorest in quality, and be comparatively safe if left with its dam for two or three days. If the cow is slow in "coming to her milk," and what the calf gets is above the average richness, it will, in many instances, be as fatal to the calf as a dose of poison. Every year scores of Jersey calves have "died very mysteriously," when the truth was, the milk of their respective dams was too rich for them. When a Jersey cow drops her calf, remove it immediately, if the cow is in health. If the cow is nervous, and frets badly, fence the calf off in one corner of the box, so that the cow can reach it and comfort herself with it.

Feeding the calf.—Give a pint of the milk first taken from its dam every few hours a few times, milking every drop of the remainder from the udder at each time. Afterwards feed about two quarts of the milk first taken from its dam (as that is much the poorer in quality) night and morning. In four or five days add a quart of hot (have all at 100°) skimmed milk to each feed, increasing the skimmed milk and lessening the whole milk as the calf thrives until all the whole milk is withdrawn by the twentieth day, if the calf is in vigorous health. Always have the milk fed to the calf at blood heat. Keep good, bright, clear, sweet rowen, and also good hay, by the calf from nearly the first. Put a fresh cut sod by the calf every few days. If the calf is costive, give the milk cooler; if too loose, give the milk at as high a temperature as the calf will take it, and in much smaller quantities. Give one-third the quantity of hot milk, and give two raw eggs, broken into its milk, night and morning, or the eggs alone. If the diarrhœa does not readily yield, give a tablespoonful of castor oil and the same of olive oil, with a teaspoonful of paregoric, mixed in a pint of hot milk. Sometimes, in desperate cases, a light feed of pure beef tea two or three times, or even longer, in place of the milk food, will act favorably. Less food and hot, with little or no medicine, is the general rule. Do not resort to medicine too hastily. The eggs rarely fail. Never give any medicine if it can be avoided. Always keep on hand the oils and paregoric, and also pulverized chalk and pulverized charcoal. Follow the oils with a teaspoonful of pulverized chalk in each feed of milk until the symptoms disappear, substituting the charcoal occasionally.

Calf-fatting.—If calves are wanted to be always fat and sleek, in a fit condition to sell to the butcher or to persons of no practical experience, who want to see things looking fine, and the breeder cares nothing for the value at the churn of the developed animals, feed oil-meal boiled for hours in a large quantity of water until the liquid is of about the consistency of thin mucilage; or feed fine corn-meal, or anything else that will produce fat. If the object of the breeder is to have his young things "fill the eye" of the inexperienced, and to sell them to such persons for long prices when young, always keep them fat and sleek. If the object of the breeder is the honorable one of producing an animal the superior of its progenitors, or at least their equal, to sacrifice any prospect of immediate gain to the production of the best practical cow possible at the churn, he will pursue a far different course. Feeding young things for present effect on the eye of the inexperienced is necessarily fatal to their largest future usefulness. To feed any substance especially calculated to produce fat to a bull, or at any time before she comes in milk, to a heifer, will induce the habit of laying on fat, which will continue through all its subsequent career. The younger the animal is when this bad habit of making flesh and fat begins, the more controlling it will be, and the more likely the animal will be to transmit that habit to its offspring.

Food, &c.—Nothing should be feed to bulls more stimulating than good hay, and at times a few oats, shorts, or both, with coarser food. Plenty of coarse hay, straw, and grass even should be given at times. The digestive organs of a butter bull, especially when young, should be taxed and distended precisely as should those of a female designed to produce butter. Heifers should be fed on nothing but skimmed milk, grass, rowen, hay, straw, in fact, everything to distend and tax their digestive organs, and with nothing more stimlating before they drop their first calf than oats or shorts or similar food. The rule for keeping young heifers to make good coats is rather extravagantly expressed by saying, "A heifer should have a paunch large enough to turn itself round in." Unsightly as they are in such a condition, such heifers make the best cows.

Oat-meal, corn-meal, or anything else necessary, should be fed as an alternative to keep a young animal in a thrifty growing condition which is, from any cause, getting out of condition, or to restore one that is off. But an animal that maintains its vigor and thrift with none, other things being equal, gives far more promise of future usefulness than one that must be pampered. The rule is to feed just enough of such things as are found necessary to keep the animal in a thrifty growing condition and no more —the less the better—and never allow a milk or butter animal to lay on fat. Experienced dairymen never go into herds that are fat and sleek for their cows. They know that the feeding necessary to produce such conditions in milk and butter animals impairs their power to accomplish the thing for which they are to be kept, namely, the making of milk or butter. Meat, not milk or butter, is what they will ever after make. They will "take better care of themselves than of their owners."

Yield of Jerseys.—The following instances have been recorded among others sent in to the newspapers by Jersey breeders:

Quayle, in his "General View of the Agriculture of the Islands on the Coast of Normandy," says that instances are named of 14 pounds of butter in a week, and that instances of 12 pounds are well attested.

Mr. H. D. Ingles, in a work on the Channel Islands cattle, published after a two-years' residence on the island, says the general average produce may be stated as 10 quarts of milk per day and 7 pounds of butter per week.

Gerard, in his description of the different varieties of cattle, says of the Jerseys in their island home: In one year the produce of a good cow in butter may be from 220 to 300 pounds (236 to 322 pounds English weight); some cows, in the season, may give 14 pounds per week.

Mr. Dauncey gave the average produce of his entire herd during the year 1867 as within a fraction of 7 pounds per head per week, dry or milking.

From Mr. Thornton's essay on Jersey cattle and their management, contributed to the journal of the Royal Agricultural Society of England, we learn that Mr. Fisk (Isle of Wight) gives his greatest return from fifteen cows as 10 pounds each weekly for several weeks. In the same essay we find Mr. Dumbrell's herd produced in 1875, from January to September, 7½ pounds per week but; as Mr. Dumbrell explains, we may assume the calculation is based on the period the cows were in milk, not on the entire nine months, dry or milking. Writing of the cows on the island, Mr. Thornton says 7 to 10 pounds of butter weekly is a fair standard, but 5 to 6 pounds per week throughout the year is a good average cow.

Mr. George Curzon, Eastcott, Watford, writes in the supplement to the English Herd-Book of Jersey cattle, that the produce of his cows in butter from the 1st October, 1881, to 30th September, 1882, averaged per cow 321 pounds 2¼ ounces. This is an average of a little over 6 pounds per week throughout the year.

Lieutenant-Colonel Partal gives his average yield of butter per cow per week in 1881 as 4 pounds 14 ounces, and in 1882 as 5 pounds 13 ounces, but we append further particulars from him:

Home farm statement as to dairy produce, 1881.

Total yield of milk from 21 cows	gallons	12,385
Butter made	pounds	4,972
Cream used	pints	324
Milk used	do	3,494
Average yield of milk per cow per annum	gallons	589
3,494 pints of milk = 218 pounds of butter 323 pints of cream = 162 pounds of butter 218 + 162 + 4,972 = total butter yield	pounds	5,352
5,352 ÷ 21 cows gives per cow per annum	pounds	$254\frac{13}{21}$
Average yield of butter per cow per week	do	$4\frac{14}{16}$

Home farm—statement as to dairy produce 1882.

Total yield of milk from 22 cows	gallons	13,825
Butter made	pounds	6,307
Cream used	pints	381
Milk used	do	3,174
Average yield of milk per cow per annum	gallons	628
3,174 pints of milk = 198 pounds of butter 381 pints of cream = 190 pounds of butter 198 + 190 + 6,307 = total butter yield	pounds	6,695
6,695 ÷ 22 gives per cow per annum	pounds	$304\frac{5}{16}$
Average yield of butter per cow per week	do	$5\frac{13}{16}$

He adds:

> Although I do not believe for one moment that the butter alone pays, yet with the skim milk the addition of calves and pigs makes the balance at the end of the year on the right side. We rear a good many calves of both sexes, and have no difficulty in disposing of them; keeping also 13 or 14 sows, and selling their progeny at thirteen or fourteen weeks old, as stores, pays well. The pigs are kept out in a three-acre pasture field in open weather and require at nights, when they come in, little but skim milk and wash, which is not expensive. I do not think that keeping pigs on grass land is half enough adopted; it keeps them healthy, clean, and growing. A post and rail fence with strong sheep wire netting, keeps them from breaking out, and rings in their noses prevent their injuring the pasture. This last year I have no record worth preserving of my dairy results, as I lost some of my best cows in the summer, which has thrown me out terribly. My system is of the simplest kind. I have the quantity of milk measured every day as brought in, and a record kept of the quantity of butter made weekly. The reason why 1882 is better than 1881 in results, is from the fact that I had one more cow in the dairy, and I gave all my cows 4 pounds of decorticated cotton-cake with chaff and mangel in the winter months when they were kept in, and 1 pound each through the summer months at each milking, or, in other words, 2 pounds a day. They had 2 pounds in the winter months, and more in the summer months. I shall hope this year (if I lose no more cows) to do better than last, as I have a very nice lot coming in from my young stock. As I seldom or never buy, a loss of a few cows affects me much. I have bought, but have never found any that please me as well as those I breed myself from either imported bulls (every one of which has taken a prize when in my possession) or from perfect bulls of my own rearing. I have no difficulty in selling either bulls or cows. By this means I know what I have got and what I am doing to improve my stock. By buying I should not know this in nine cases out of ten.

Among the detailed records sent into the British Dairy Farmers' Association for the challenge cup, the only one relating to Jerseys was Lord Braybrooke's, which is interesting and sufficiently good to be annexed, although the yield is certainly not so good as could be found upon many farms where Jerseys are kept by dairy farmers.

Dairy record of Lord Braybrooke's herd of Jerseys for 1882.

Cow.	Born.	Last calf.	Weeks in milk.	Milk.				Cream.	Butter.				Skim milk.
				Quantity.		Average per week.		Percentage.	Pounds.	Average per week.	Product to a gallon of milk.	Milk to a pound.	
No.		1882.		*Qts.*	*Lb.*	*Qts.*	*Lb.*				*Oz.*	*Qts.*	*Qts.*
*1	1870	Aug. 10	47	2,138	5,571	45	118	10.5 to 21.5 = 15.8	299	6¼	8¾	7	1,796
†2	1873	Aug. 9	27	1,476	3,837	54	142	12 to 21.5 = 16.8	227	8¼	9¼	6½	1,227
‡3	1873	Apr. 8	32	1,401	3,751	43	117	10.5 to 23 = 15.2	193	6	8¾	7½	1,188
4	1874	Nov. 8	50	3,609	9,188	72	183	9 to 20 = 11.1	364	7¼	6¼	9¾	3,207
5	1875	Nov. 6	42	2,260	5,880	53	140	10 to 23 = 15.1	312	7¼	8¾	7	1,918
6	1875	Apr. 5	43	2,556	6,667	59	155	11 to 23 = 14.8	352	8	8¾	7¼	2,204
7	1876	Aug. 5	50	2,858	7,428	56	148	10 to 18 = 13.4	348	6¾	7¾	8	2,473
8	1877	Sept. 5	49	2,295	5,991	46	122	15 to 26 = 19.5	407	8¼	11¼	5½	1,847
9	1877	Feb. 4	38	2,363	6,150	62	161	11.5 to 21 = 14.7	317	8¼	8½	7¼	2,015
		1881.											
10	1877	Apr. 3	26	759	1,979	29	98	11.5 to 19.5 = 15.1	105	4	8¾	7	644
		1882.											
11	1877	July 4	45	1,923	5,111	42	113	13 to 31 = 20.3	352	7¾	11½	5¼	1,542
12	1878	Feb. 3	45	1,615	4,199	35	93	14.5 to 33 = 20.6	301	6¾	11¾	5¼	1,282
13	1878	Dec. 4	30	1,193	3,104	39	103	13.5 to 20 = 15.6	167	5½	8¾	7	1,030
14	1878	Oct. 4	33	1,176	3,071	35	93	16.5 to 24.5 = 17.5	183	5¾	9¾	6¼	970
15	1879	Oct. 2	50	1,768	4,770	35	95	15.5 to 23.5 = 18.2	286	5½	10¼	6	1,443
16	1879	Jan. 1	49	2,932	7,438	59	151	10 to 25 = 14.3	380	7¾	8¼	7¾	2,512
17	1880	Nov. 2	47	1,294	3,367	27	71	11 to 24.5 = 15.3	178	3¾	8¾	7¼	1,096
18	1880	Nov. 2	43	1,356	3,524	31	81	10 to 19 = 13.4	162	3¾	7½	8¼	1,173
19	1880	Feb. 1	31	1,124	2,924	36	94	12 to 18.5 = 14.5	142	4½	8	7¾	961
20	1880	Dec. 2	44	2,214	5,798	50	131	11 to 24 = 14.6	296	6¾	8½	7¼	1,883
				38,310	99,748				5,371				32,411

* Killed October, 1882.
† Killed September, 1882.
‡ Died (milk fever) November, 1882.
§ A bad year with her. Her yield in 1880 = 2,631 quarts, 1881 = 2,432.

Analysis.

Description.	Milk.		Butter.	Skim milk.
	Quarts.	*Pounds.*	*Pounds.*	*Quarts.*
Under 4 years of age:				
Average per cow for the year*	1,781	4,636	240	1,513
Average per cow per week for the entire year*	34	89	4½	29
Average per cow per week while in milk	40	105	5½	34
4 years and under 6 years:				
Average per cow for the year*	1,859	4,855	281	1,555
Average per cow per week for the entire year*	35	93	5¼	29
Average per cow per week while in milk	46	121	7	38
6 years and over:				
Average per cow for the year*	2.756	7,124	353	2,363
Average per cow per week for the entire year*	53	137	6¾	45
Average per cow per week while in milk	54	142	7	47
Entire herd, all ages:				
Average per cow for the year*	2,017	5,262	283	1,710
Average per cow per week for the entire year*	38	101	5½	32
Average per cow per week while in milk	46	121	6½	39

* In these calculations consideration is given to the period from the death of Nos. 2, 3, and 5, to the end of the year.

Average weight of milk per gallon	pounds	16 13/32
Average cream percentage	do	15½
Proportion of butter to milk (ounces to a gallon)		8.972
Proportion of butter to cream (ounces to a quart)		1.1¼
Proportion of milk to butter (quarts to a pound)		7.13?

Comparative richness of milk at different stages of the same milking, showing the great importance of thoroughly draining a cow's udder. [*In each case the result given is the mean of six days' testing.*]

Cow No.—	Percentage of cream.			Comparison.		
	First ¼ pint.	Last ¼ pint.	Pail, *i. e.*, the entire yard.	First ¼ pint.	Last ¼ pint.	Pail, *i. e.*, the entire yard.
1	5.8	33.5	15.5	1	5.77	2.67
2	4.7	26.2	14.4	1	5.57	3.00
3	4.5	28.6	12.0	1	5.24	2.66
4	5.4	36.0	18.7	1	6.66	3.46
5	10.0	34.8	18.4	1	3.48	1.84
6	8.2	40.1	15.8	1	4.89	1.92
7	7.1	36.0	15.2	1	3.66	2.14
8	5.3	32.8	15.3	1	6.18	2.88
9	3.7	40.0	15.1	1	10.81	4.08
10	6.1	25.3	13.8	1	4.14	2.26
11	5.9	26.5	12.5	1	4.49	2.11

Food of cows during the year 1883, *with one or two trifling exceptions in individual cases.*

Jan. 1 to Feb. 19.—¼ peck bean-meal, 3 pecks grains, ¼ peck malt dust, 2 pecks chaff, 8 pounds hay, 10 pounds carrots per day; two to four hours each day on grass.

Feb. 20 to Apr. 2.—The same, with 10 pounds of mangold instead of carrots; three to six hours on grass.

Apr. 3 to May 7.—Hay reduced to 4 pounds, other food same; four to ten hours on grass.

May 8 to May 21.—¼ peck bean-meal, 3 pecks grains, ¼ peck malt dust, 2 pecks chaff, 4 pounds hay, 10 pounds mangold; ten to twenty hours on grass.

May 22 to July 9.—⅛ peck bean-meal, ⅛ peck crushed oats, 1½ peck grains, 1 peck chaff, 10 pounds mangold; twenty hours on grass.

July 10 to 20.—⅛ peck bean-meal, ⅛ peck crushed oats, 1 peck chaff, 1½ peck grains; twenty hours on grass.

Aug. 21 to Oct. 26.—¼ peck bean-meal, ⅛ peck crushed oats, 3 pecks grains, 2 pecks chaff; twenty hours on grass.

Oct. 27 to Nov. 20.—¼ peck bean-meal, ⅛ peck crushed oats, 3 pecks grains, 2 pecks chaff, and 4 pounds hay; eight hours a day on grass.

Nov. 21 to Dec. 31.—¼ peck bean-meal, ⅛ peck crushed oats, 1 peck grains, 10 pounds carrots, 7 pounds hay, ¼ peck malt dust; two to four hours a day on grass.

Percentage of cream from the milk of the entire herd, for each week in the year 1882.

Week ending—	Per cent.	Week ending—	Per cent.	Week ending—	Per cent	Week ending—	Per cent.
Jan. 8	17.73	Apr. 9	14.76	July 9	12.8	Oct. 8	15.7
Jan. 15	16.75	Apr. 16	16.18	July 16	12.59	Oct. 15	16.1
Jan. 22	16.	Apr. 23	15.98	July 23	12.66	Oct. 22	17.2
Jan. 29	17.42	Apr. 30	15.09	July 30	14.4	Oct. 29	16.4
Feb. 5	16.13	May 7	14.63	Aug. 6	13.64	Nov. 5	10.6
Feb. 12	15.96	May 14	16.33	Aug. 13	14.37	Nov. 12	17.3
Feb. 19	14.29	May 21	14.96	Aug. 20	15.4	Nov. 19	17.
Feb. 26	14.52	May 28	13.86	Aug. 27	13.8	Nov. 26	16.9
Mar. 5	14.23	June 4	14.61	Sept. 3	15.1	Dec. 3	17.5
Mar. 12	14.69	June 11	13.83	Sept. 10	14.	Dec. 10	18.
Mar. 19	16.16	June 18	14.97	Sept. 17	15.5	Dec. 17	17.3
Mar. 26	17.17	June 25	15.86	Sept. 24	15.9	Dec. 24	17.8
Apr. 2	16.79	July 2	13.77	Oct. 1	16.5	Dec. 31	17.2

Butter to a gallon of milk, and milk to a pound of butter, in comparison with its cream percentage as shown by the year's testing.

Cream.	Butter to a gallon of milk.	Milk to a pound of butter.	Cream.	Butter to a gallon of milk.	Milk to a pound of butter.	Cream.	Butter to a gallon of milk.	Milk to a pound of butter.
Per ct.	*Ounces.*	*Quarts.*	*Per ct.*	*Ounces.*	*Quarts.*	*Per ct.*	*Ounces.*	*Quarts.*
8	4½ to 4¾	13¼ to 14	13	7¼ to 8	8 to 8¾	17.5	9¾ to 10¾	5¾ to 6½
8.5	4¾ 5	12¾ 13¼	13.5	7½ 8¼	7¾ 8½	18	10 11	5¾ 6¼
9	5 5½	11½ 12¾	14	7¾ 8½	7½ 8¼	18.5	10¼ 11¼	5½ 6
9.5	5¼ 5¾	11 12	14.5	8 8¾	7¼ 8	19	10½ 11½	5¼ 6
10	5½ 6	10½ 11½	15	8¼ 9¼	6¾ 7	19.5	10¾ 11¾	5¼ 5¾
10.5	5¾ 6¼	10¼ 11	15.5	8½ 9½	6½ 7	20	11 12	5¼ 5¾
11	6 6¾	9¾ 10½	16	8¾ 9¾	6½ 7	20.5	11½ 12½	5 5½
11.5	6¼ 7	9 10¼	16.5	9 10	6¼ 7	21	11¾ 12¾	5 5¼
12	6½ 7¼	8¾ 9¾	17	9½ 10¼	6 6½	21.5	12 13¼	4¾ 5½
12.5	6¾ 7½	8½ 9¼						

The proportion of butter to cream has varied during 1882 from 16½ to 18½ ounces to a quart.

Lord Braybrooke's figures are given as an example of an ordinary English herd, which, although about the oldest in the Kingdom, is certainly not above mediocrity, although the yield is such as to make it decidedly profitable. The best butter-making cows in England are undoubtedly those which have about three-fourths Jersey blood and one-fourth Red Poll, Devon, or Shorthorn.

Statistics of an Isle of Wight Jersey herd.—Mr. J. R. Fisk, of Brightstone, Isle of Wight, who has kept Jerseys for a number of years, declares his belief that they will produce a larger quantity and better quality of butter than any other breed on the same amount of food. He says:

> I have compared them with other breeds in the island and I am quite satisfied that they are the best butter cows I know of, and not only as to butter, but they will compare favorably with other cows in quantity of milk, and that of a richer quality. Their constitution is not so delicate as is generally supposed. With fair management the home-bred Jerseys are comparatively hardy, and this can be seen by the general treatment of my herd. The colors of the animals are mostly whole color—silver grey and fawn, some being broken. The breed which was originally imported into the island was broken, and a whole-colored cow was seldom to be seen. The cows are not housed in winter, but have a yard with an open shed, good straw or rough hay, and a run on the pasture in the day-time if the weather should be fine. As soon as they calve I house them and feed them on hay and bran mash for several days until they are quite safe over calving, and then they are fed with 6 pounds of corn meal or cotton cake, 1 bushel of mangel-wurzel and hay, and a run on a fresh pasture for an hour or two in the day if the weather should permit, until April or May, when they lie out at night. I continue the meal or cake as long as the cow is milked, and vary the quantity according to the feed they obtain on the pasture.

The young stock have a yard with a shed, and feed on hay, with a few roots or 3 pounds of cake per day through the winter, and a run on the rough pasture through the summer. The heifers are allowed to go to the bull at fifteen months old. The calves which are weaned are taken from the cows from three days to a week old, and as soon as they will drink well and are strong they are kept on skim-milk, good hay, and a little corn-meal until three or four months old. If it should be summer they are turned out on the pasture in the day and housed at night until they are old enough to lie out. I bleed the calves dropped in the spring, in the fall of the year, as a preventative for quarter-evil. I reckon that my whole herd in summer, including heifers, give 12 quarts of milk per day, but I have several cows which would give 20 quarts. I have a record of 20 cows giving in the month of June, 1883, 256 quarts of milk, 29⅓ pounds of butter, per day, and 1 cow 112 quarts of milk, 11 quarts of cream, and 12 pounds of butter per week three months after calving. The average yield of butter throughout the year for 17 cows and 6 heifers is 6½ pounds per head. In the height of summer 13 cows averaged 12 pounds each per week.

The weight of a bull or cow when fatted is from 28 to 35 score.

The Jerseys are seldom steered. If the bull calves are not required for stock they are allowed to suck the dams, and fattened as calves, weighing from 60 to 100 pounds at one to two months old. The mean temperature on the average for 16 years worked out as 49°.38′. In the winter it was 39°.99′; spring, 46°.92′; summer, 59°.63′, and in autumn, 50°.78′. During one year there were 242 days on which a southwest wind was prevalent; 72 days with a northeast, and 40 with a northwest wind. Southeast winds are very rare. The island rests on the Wealden, and the surface comprises clay, gravel, sand, chalk, freestone, and loam. The downs are chalk, rising from 400 to 800 feet above the level of the sea. The grasses which are chiefly cultivated are the several sorts of rye grass, including the Italian. Clovers are broad, Dutch, alsike, trefoil, cow clover, and trifolium.

(8) GUERNSEY CATTLE.

This really first-rate breed is a native of one of the Channel Islands, off the coast of France, and is largely bred by a class of farmers who hold small quantities of land which they cultivate very highly, and, like the Jersey people, breed a much larger number per acre than is done in any part of England. They are a most docile race, well cared for in sheds in the winter, and almost invariably tethered in summer on the grass. There is no difference of opinion in England as to the merits of the Jersey and the Guernsey among those who understand both races, but it must be admitted that the Jersey is a very much greater favorite, although why it is so would be very difficult to say if we did not think that color and a more deer-like form has something to do with this. The Guernsey is a much larger beast than the Jersey, and, although coarser, is still extremely delicate in texture of skin, while she is much more fleshy, is far more easily fatted, and is salable to the butcher at almost any time, provided she is well kept, which the Jersey certainly is not. Indeed, it may be fairly estimated that when an old Jersey cow past breeding is only worth £7 to £8, a Guernsey is usually worth £15.

This race is now bred with extreme care, although it has some faults from a butcher's point of view, being bred for milk almost alone, and by a comparatively small number of breeders. The color is, plainly speaking, an irregular yellow and white, or, according to the shade, as it is generally called, orange or lemon and white. It is a grand butter-making cow, and will equal the best Jerseys, while it is certainly a deeper milker. We may here mention that the Guernsey breed is strictly confined to the island of Guernsey, as the Jersey is to the island of Jersey, and although the last named was for many years known as the Alderney, it is so no longer, for the Alderney people have at last started a herd book for their own race, which they are determined to perfect in the same way as the other breeds have been perfected. Guernsey, small as it is, exports between one and two thousand cows annually, the majority of which come to England, and at the present time the demand for really good cows is considerably greater than the supply, the only breeders who breed carefully finding it at all times difficult to obtain what they want.

This breed is one which it will pay any butter-maker to take up and perfect, for it certainly has, as will be seen from what we have said and what we shall show, a far wider scope of usefulness than the Jersey can possibly have while it is bred in its present form. For crossing the Guernsey imparts quality of milk without that loss of quality of flesh which is generally found in beasts crossed by the Jersey. The butter, like the cream, is always wonderfully rich in color, and extremely delicate in flavor, and many cases can be quoted in which 700 pounds have been reached in the twelve months, although these, of course, are exceptional, while, with regard to the quantity of the milk, it is generally found that 8 quarts is within the mark, good herds often yielding an average of 16 quarts per day during the best months, although, as with other cattle, individal animals frequently exceed 20 quarts.

Another good feature in the Guernsey is the fact that it is not only a good milker after calving, but continues to milk well during the whole season. In form it is generally fine and narrow in front, widening until it reaches the hips, which are broad. The udder is large and flat, the teats long and wide apart, and the escutcheon perhaps more prominently pronounced than in any other race. It is generally believed that one or two Guernsey cows in a herd in which the milk is less rich imparts quality and color to the whole of the butter made. Cheese is not made from this race, except in isolated instances, and then only for private use. It does well upon all soils, and we know instances in which its returns are enormous, although the situation is as bleak and exposed as the Welsh hills. At the same time a chalky or a gravelly soil is preferred. In its native island and in the south of England it does better work than in the north, but some of the northern breeders are much pleased with the results they obtain from it, and do not seem to consider it at all inappropriate to their districts. It is never used for draft purposes.

Experience of Guernsey breeders.—Mr. J. de Garis, Rouvets, says:

My herd in 1882 consisted of 1 cow, fourteen years of age, calved February, 1882; 1 cow, ten years old, calved December, 1881; 1 cow, four years old, calved March, 1882; 1 cow, same age, calved July, 1882; 1 heifer (first calf), calved May, 1882. I used not less than 4 quarts of milk daily in my family. The following are the amounts of marketable butter made each month: January, 69 pounds; February, 70 pounds; March, 96 pounds; April, 134 pounds; May, 96 pounds; June, 109 pounds; July, 136 pounds; August, 132 pounds; September, 151 pounds; October, 112 pounds; November, 77 pounds; December (partly estimated), 80 pounds; total, 1,262 pounds; average per cow, 252 pounds.

Mr. W. Carrington, of King's Mills, says that his cow Le Cheminant produced an average of 16 pounds per week for months after calving.

Messrs. C. Smith & Son state that three cows owned by them gave the following records:

Vesta, born March 1, 1873, calved May 7, 1882, served June 11, 1882, in five days—December 4 to December 8, inclusive—gave 60½ quarts, an average per day of 12.1 quarts; Vesta Second, born April 25, 1877, calved October 12, 1882, served November 2, 1882, gave in five days, of same date, 74 quarts, an average of 14⅘ quarts per day; Vesta Third, born May 1, 1878, calved November 27, 1882, gave in five days, same date, 85 quarts, an average of 17 quarts a day.

Mrs. White, Roussaillerie Farm, states that two cows owned by her have given the following quantities of milk during the year in five months:

Red cow, six years of age, 2,482 quarts, record commencing July 1 and closing November 30; number of days' record, 153; average per day, $16\frac{35}{153}$ quarts. Brown cow, eight years of age, 1,944¼ quarts; record during the same time, 153 days; average per day, 12.6.

Milk record of a Guernsey cow.—An English breeder of the Guernsey gives the following particulars with regard to the cow No. 630, in the Royal Guernsey Agricultural Society's Herd-Book. She calved on 15th May last, and the record is from July 9 to 15. The cow was fed on clover only. The amount of butter made from the week's yield was 15 pounds 6 ounces:

Date.	Morning.	Noon.	Night.	Total.
	Lbs. oz.	*Lbs. oz.*	*Lbs. oz.*	*Lbs. oz.*
July 9	15 8	10 8	14 12	40 12
July 10	16 0	9 8	15 8	41 0
July 11	14 8	12 0	12 8	39 0
July 12	16 0	11 0	13 0	40 0
July 13	14 8	11 8	12 12	38 12
July 14	15 0	10 8	12 8	38 0
July 15	15 8	9 8	13 0	38 0
Total	....	....	....	275 8

Guernseys in the Isle of Wight.—The Rev. W. A. Glynn, of the Isle of Wight, the well-known English breeder, says:

> My Guernseys are quite pure, and I generally carry about 30 to 40 head. I commenced with the breed twenty years ago. I register daily at each milking the quantity of milk each cow gives, the annual average yield being 650 gallons, or, taking a gallon as weighing 10½ pounds, 6,825 pounds; but some of the cows yield 800 to 900 gallons a year. Two gallons, or 21 pounds, of milk make 1 pound of butter. I never make cheese, nor have I weighed a live carcass, but the average weight without head, skin, and offal, is about 740 pounds.
>
> The color of the Guernsey is lemon and white, and they arrive at maturity in about three years. The produce of my cows is all sold as milk in the yard to a dairyman at a shilling per gallon. The annual average return is about £32 10*s*, while the cost is £15. They have 4 pounds of decorticated cake daily through the year; from about May 1, to Christmas they run in the fields, and the rest of the year sleep in the open shed at night, and have 28 pounds of mangel and 12 pounds of hay if fresh, the milkers in winter receiving an additional 6 pounds of bran. During June, July, or August if the pastures are short they get vetches; from October to Christmas cabbage, and mangels from Christmas to May.
>
> I have bred with a view to useful and good dairy stock, but last year exhibited with wonderful success the cow "Vesta," which was shown four times. I won the 1st twice; the 3d, once, and the reserve, besides being once very highly commended. With another, which was also shown four times, I won the 2d three times, and was very highly commended once; also the champion milking against 23 others once, and the first milking once. With my bulls I have also been very successful in obtaining honors. I started with the best blood I could get in Guernsey, and I carefully breed for produce in quality and quantity. The quality on analysis at the dairy show gave the specific gravity as 1.0316; total solids 14.25; fat, 5.54; solids not fat, 8.71; percentage of cream by volume, 7.5, and drew special remark from the analyst as being the richest specimen of milk.
>
> I find that the stock raised here are far more hardy and do far better than when imported from Guernsey. I infinitely prefer them, and only resort as seldom as I can to fresh blood from Guernsey. I carefully select my breeding stock, and do not force them, but keep them in good order. I find no difficulty in finding purchasers, and as I receive many applications, I place them in a book to be entertained in rotation. Many gentlemen who have acted as judges of Channel Island stock at various shows come to my herd to purchase. Our soil is a medium loam, partly on gravel and partly on clay, much of which was recently laid down to pasture, but is not good for the production of milk. The climate is good, I may say more temperate than in most parts of England, the altitude being from 50 to 150 feet above the sea, near to which we are.

Record of a Guernsey herd in Sussex.—Mr. Nevill Wyatt, of Cuckfield, Sussex, who has taken such trouble with the Guernsey Herd-Book, says:

> I farm 123 acres of poor soil, called the Weald of Sussex, and it is the queerest mixture of clay, sand, and gravel, as sometimes in the same field where pure sand is quarried for building purposes there is found some 40 or 50 yards of stiff clay. The natural soak is bad, as the beds of clay bank back the water. The farm, however, *now* is all

tile-drained 3½ feet in depth, but the distances between the drains vary. The cow-house is situated on the north side of a hill, but so high that the sun shines on it all day, from the time it rises till it sets. The ridge upon which the farm is is supposed to be the prettiest but coldest spot between London and Brighton. As the crow flies, I am about 12 miles from the sea, and, with a southwest gale, *salt* is often driven with it, and the windows thereby are streaked with the salt. I look on the Guernsey as a better animal all round than the Jersey. It is hardier, and I have only lost one, and that through cancer, which it had in the heart. The Guernsey gives more milk, and it is equally rich, and when done with sells for more to the butcher. I sold at open market, where Sussex and Shorthorns are the usual run of beast, a five-year-old Guernsey, which slipped her calf a fortnight before, for £18.5*s*. Jerseys in that case fetch from £5 to £9. I have sold others at £15 to £18. They do not fatten easily, but they always cut up far better than they look; in fact, where a Shorthorn looks fat *outside*, a Guernsey *is* fat inside.

My cattle are all housed in a large, well-ventilated cow-shed from October or November, according to weather, till there is a good bite of grass in the spring. On grass they get per day each about 1 pound of decorticated cotton cake. The yearlings run out all winter, but have a shed where they can go to, and in winter-time they get for food oat straw, and from 1½ to 2 pounds of linseed cake and locust beans in equal proportions.

The cows are fed 3 times a day. In the morning and evening they receive each hay and straw (oat) chaffed with pulped roots, all steamed, with 1 pound of middlings and 1 pound of maize meal mixed with it, and in the middle of the day they get hay and straw chaff with pulped roots, not steamed. In addition I give them, according to the milk they are giving, from 1 to 4 pounds of cake a day, ¾ of decorticated cake and ¼ linseed, heifers with their first calf only having linseed. I test the milk from time to time, and the average of cream is about 15 per cent.; the lowest, and which only one cow gave, being 13 per cent., whilst the highest was 18 per cent.; but 15 per cent. I calculate is a fair average. I calve my heifers down at any time from 21 months.

The fault I find with Guernseys is in their bony and angular rump and shortness from hip bones to tail. I am trying to improve this, but find it difficult to get bulls to please me. In addition, a great many have the tail sticking up too high. These things are what make a Guernsey *look* so thin, and it is hard to cover these angularities with flesh. I am in hopes, however, that I shall speedily improve these points, as I have a very good bull of my own breeding, and I shall put him to his own daughters and with their progeny breed out again. I only once tried a test with regard to butter, and that with *not nearly* my best cow. She had calved 6 weeks before, and had just returned from a show and was not milking well, but I wanted to make a rough guess at what a Guernsey could do. She made 9¾ pounds of butter in 7 days from 83 quarts of milk. I have only known of one steer being fattened, but he made a nice beast, and was sold when 3½ years old, in the beginning of December, 1883. He realized £23, and as butchers around here are very prejudiced, and will only look at Sussex and Shorthorns, I did not consider it a bad price.

The following are particulars of my herd as submitted:

[Production by quarts.]

Name.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
													Quarts.
Rosebud, 1881 (aged)	229	191	181	183	192	164	87	28	....	....	.....	277	1,484
Rosebud, 1882	300	259	224	197	179	163	153	....	....	305	411	366	2,620
Beckie, heifer	255	172	166	191	170	128	....	....	....	....	.....	291	1,376
Topsy, aged	363	262	258	290	274	250	209	118	77	17	(dry)	403	2,525
Sunbeam, 2d calf	....	....	300	386	353	271	260	222	157	52	.....	....	2,064
Sunbeam, 3d calf	123	*417	377	268	255	268	250	219	185	135	81	17	2,600
Goldbud, 2d calf	....	....	120	384	342	286	261	225	183	133	64	12	2,012
Jean, 3d calf	143	125	128	211	382	†36	345	284	245	192	171	148	2,765
Valentine, 1st calf	144	125	129	....	....	117	‡292	214	183	140	148	147	1,526
Golden Leaf, 1st calf	....	8	§350	256	179	148	128	87	51	....	.....	....	1,210
Changeling, 1st calf	....	....	....	14	261	279	248	189	133	94	.....	....	1,220
Gift heifer, 1st calf	....	....	....	....	65	‖300	287	222	180	143	123	124	1,444
Bailiff's daughter, heifer	....	....	....	....	....	....	....	23	206	202	180	139	ill......
Fortune, heifer	....	....	....	....	....	....	....	....	171	208	180	186	....
Mono, heifer	....	....	....	....	....	....	....	....	....	....	218	247	....
Queensbury, heifer	....	....	....	....	....	....	....	....	....	....	237	282	....
Cherne Pie, heifer	....	....	....	....	....	....	....	....	....	....	54	278	....

*15 quarts. †13 quarts a day. ‡9½ quarts a day. §11⅓ quarts a day. ‖10 quarts a day.

Notes on Guernsey cattle by a Guernsey farmer.—Mr. James James, of Guernsey, another breeder of considerable notoriety, sends the following remarks upon them:

There can be no more practical question connected with land than that which has reference to the value of the different breeds of cattle peculiar to the British isles. They may be classified under two heads: the beef producers, and those more especially adapted for the production of milk. To this latter class my remarks have special reference. Probably in no one breed shall we find these two qualifications more fully combined than we do in that which is peculiar to the island of Guernsey. This and the sister island of Jersey form two of the group known as the Channel Islands. They have each a breed peculiar to themselves, which differ widely in many essential points. The Guernsey is the larger of the two and very similar to that bred in Alderney, another of the islands composing the Channel Islands group.

The Jerseys for a long time have been designated as Alderneys, but for what reason I am unable to explain. This latter island is under the same government as Guernsey, has similar laws, and enjoys the same privileges. It is not so, however, with Jersey, for in this island the government differs. No admixture of the Guernsey and Jersey breeds is permitted. From almost time immemorial the Guernsey cattle have been jealously guarded; stringent laws have been passed, prohibiting the importation of any foreign cattle for breeding purposes, and notwithstanding the various attempts made to repeal them, the royal court of the island has always confirmed and strengthened its former prohibitions. Thus under no circumstances whatever can there be any admixture of foreign blood, and the farmer can consequently boast of a breed of cattle eminently pure and distinct, beautiful in appearance, and surpassed by no other in its distinguishing characteristic. As regards its original habitat, opinions differ very widely; we may, however, reasonably infer that it had its origin in some part of the French continent. It is a matter of history that the islands of Jersey and Guernsey, as far back as the sixth century, were united to the mainland by a single plank.

This breed of cattle has long been famed for its cream and butter producing qualities, and it is also eminently adapted for the shambles when, from age or other causes these valuable properties fail to be profitable. They are exquisitely delicate in form, in color varying from light-red to lemon and orange-fawn, occasionally black, almost all having a considerable admixture of white. In individual cases it is black, encircled with light-colored hair.

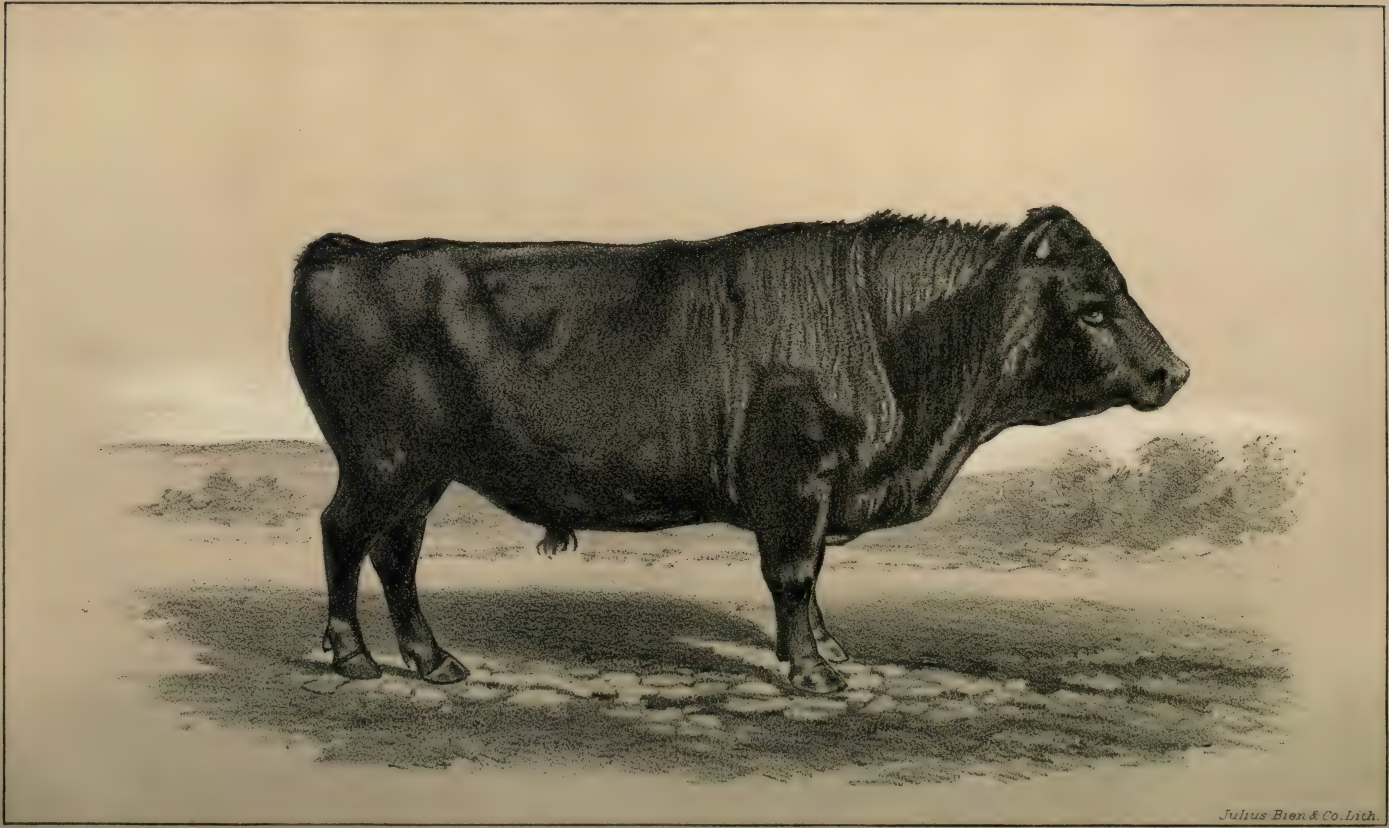
The most approved points of a Guernsey may be considered to be as follows: Head small but long; eye bright, lively, but placid; horns small and well turned upwards, being fine, yellow, and waxy at the bases; ears small and thin, with fine thin hair and a deep golden color inside; nostrils open; neck long and slender, tapering towards the head; shoulders thin; forequarters light; limbs delicate; back straight and broad behind; tail fine and thin, set on at right-angles with the back; hide thin and mellow to touch; carcass deep and well let down; hindquarters full and large; udder capacious, broad, and square, well in line with belly and stretching well forward, not fleshy, silky with fine down or hair; milk veins very large and prominent; teats large and strutting outwards and well apart; the general figure compact, wedge-shaped; skin tinged with a deep orange-yellow throughout, especially marked inside the pastern joint. To these essential points may be added those tests as shown by the Guenon theory, and which when properly understood and applied are most valuable as indicative of milk-producing properties.

The opinion of the Guernsey farmer is much divided as to what may be considered the most approved points of the male animal. Some prefer the bull which possesses many of the points as approved in the female; others, those of the more masculine type. Since the superiority of the Guernsey cow for dairy purposes is so generally admitted, we must not, I think, be guided so much in our selection by what may be the approved points of excellence in the individual animal as by a knowledge of his parentage, and this knowledge becomes of still more importance when we consider that the male undoubtedly acts the principal part in impressing his character upon the offspring.

Of late years there has been a very marked improvement in the cattle throughout the island. The breeder has become more alive to the value of his cattle, and, stimulated by a very large and increasing demand both from England and abroad, he has devoted increased care and attention to the breeding and rearing of his stock. Where careful and intelligent breeding has been pursued, selecting fitting sires and dams, a very marked and increasing excellency has been stamped upon the progeny. Earlier maturity, increase of size, a more fully developed lacteal system, and a stronger constitution have been the result, and with perseverance in such a course these essentials will become intensified.

Two herd-books have been established, one on the principle of selection and the other in the form of a register, admitting within its pages all cattle in the island

PLATE 15



Julius Bien & Co. Lith.

KERRY BULL.

Great difficulties must be experienced by breeders and purchasers whilst these two registers are at variance with one another; instead of affording information and assistance, confusion and perplexity must be encountered. As a guide to selecting sires and dams a general register will meet every requirement; the breeder will be enabled to trace the parentage of any animal he may require, and to form his own judgment as to its individual merits.

The Guernsey being essentially a dairy breed of cattle, it behooves the island farmer to devote still more attention to the actual yield of milk and butter by the individual members of his herd. Experiments and trials tending to elucidate this matter have been meager in the extreme, and it is only in a very few cases that I have been able to obtain reliable information upon the subject. On some of the best land in the island a number of animals are still reared which are a discredit to those concerned. At our annual fairs or markets the number of animals exhibited for sale are proportionately small. The cause why good and desirable stock is scarce is partly to be attributed to this and partly to the lack of knowledge of good breeding.

Too little attention has hitherto been given to the use of good bulls; animals born from indifferent parents, and not possessing a single desirable quality, have been coupled, very much to the detriment of the offspring. A good bull may be used, but the farmer makes the mistake of employing inferior females. The bull being capable of transmitting to his progeny his own peculiar properties, and whatever excellencies he may have inherited from his ancestors becoming marked in it, it will become necessary for the breeder who seeks to improve his stock to be careful to make a choice of such animals whose parents have been endowed with those characteristic qualities, and which he seeks to intensify in the offspring. The form, character, and development of the lacteal system of the females is no less important, and if it is hoped to arrive at success in breeding one must follow out in practice these essential principles of breeding. By thus selecting our breeding stock, and by a careful and generous system of rearing the offspring, a very great and marked improvement in this valuable breed of dairy cattle will be the result.

(9) KERRY CATTLE.

The animal represented in the accompanying engraving was, with seven picked heifers, selected from the celebrated herd of the Knight of Kerry last spring. Like his companions, he is jet black, the color of the purest strain. His height at shoulder is 3 feet 6½ inches; his girth at same point, 5 feet 7 inches. He carries bulk for his size, with shape and symmetry, and stands a perfect picture, a model bull in miniature, showing all the recognized bovine points in strong development, with some that are peculiar to himself.

The qualities of the Kerry are as follows: (1) head rather small, balanced, and tapering; (2) cheeks clean; (3) throat full and well set; (4) muzzle fine; (5) nostrils high, well placed, and rather open; (6) horns well sprung, smooth, rather thick at base, but gently tapering, and tipped with black; (7) ears small, fine, and of a pink-orange color within; (8) eyes mild and full; (9) neck straight and fine; (10) chest deep and broad; (11) barrel deep and well hooped; (12) ribs well home; (13) back even and straight from withers to top of hip; (14) back straight from top of hips to setting of tail; (15) tail long and fine; (16) hide of good color, slight, loose, and covered with soft hair; (17) fore leg short and straight, full above the knee, fine below; (18) hindquarters well filled up; (19) hind legs not too close together and squarely placed; (20) hoofs small; (21) udder well rounded, full and capacious, in line with belly and well up behind; (22) teats well placed, large, and rather far apart; (23) milk veins very prominent; (24) color, rich black preferable, although there are some very good animals of other colors.

Although of very small size, the cows yield a large quantity of milk, rich in cream; they fatten fairly easily upon even poor pasture, and are certainly superior to all other breeds for hardiness and the power of subsisting upon the scantiest herbage. Mr. Pierce Mahony says:

> I have now a good number, but most of them are heifers with their first calf. Notwithstanding this, many of them are giving from eight to ten quarts of milk a day

each, but it is in the quality of the milk that they specially excel. I have not as yet tested the milk of all, but among those tried I have found many to give 10 per cent., 11 per cent., 12 per cent., and 13 per cent. of cream, while one has gone as high as 15 per cent. This, with an average live weight of from six to seven cwt., is, I think, a satisfactory result. An imported Alderney, after her fourth or fifth calf, on the same pasture, is only giving seven quarts of milk, containing 12 per cent. of cream. The pure Kerry is a graceful animal, with finely formed limbs and a grand constitution, capable, I believe, of great development on good land.

Mr. Richard Barter, an extensive farmer, breeder, and dairy-owner, says:

Having a large dairy, with a few pure Jerseys, and always 7 or 8 Kerries through the stock, I can bear testimony to the great value of the Kerry as a cow, in proportion to her size, and the amount and quality of food she consumes. Her points are the following: She yields a large quantity of rich milk, is extremely hardy, is easily kept, is, moreover, docile, easily fatted when done milking, and is moderate in price. I know of no cow which is so suited to families where only two or three are kept, or for light, upland pastures. I have a large upland farm entirely stocked with them.

Mr. A. J. Knight, in the following fact, supplies, in all likelihood, the reason which led him to from his herd:

Last year I had a Kerry cow given me, sent over from Kerry, where she had been much admired as a perfect specimen. This cow beat two valuable and lately imported Guernseys here, giving a larger quantity of equally rich milk; and, whereas the Guernseys looked poor and miserable during the winter, the Kerry was always in good condition and happy. All had a mixture, in equal quantities, of best oil and cotton cake, at the rate of 5 pounds of the mixture to each cow per day.

Professor Baldwin, the well-known Irish agriculturist, bears this testimony:

The Kerry is small in size, exceedingly hardy, and can subsist on poor and exposed pasture. It often bears a close resemblance in size, shape, and color to the native cattle of Wales and Brittany. The color preferred is black, with a ridge of white along the spine, and a white streak along the belly. Cattle of true Kerry descent are met with of other colors. Thus, I have seen them brown, black, and white, and black and brown. The horns are fine, somewhat long, and turned upwards at the points. The skin is soft, unctuous, and of a fine orange tone, which is visible about the eyes, the ears, and the muzzle. The beef is tender, well marbled, and commands the highest price in the market. The milk is peculiarly rich and well flavored, and the quantity of it yielded, even on hard fare, is so great that the Kerry has been styled the poor man's cow. Professor Low observes, that in milking properties, the Kerry cow, taking size into account, is equal or superior to any in the British Islands.

Mr. James Robertson observes:

As Youatt says, the Kerry may be truly described as the poor man's cow, living everywhere, and the description is thoroughly accurate. The Kerry will live and thrive in almost any climate and temperature, on the site or summit of a Kerry Mountain or in the poor undrained lands of the lowlands. I have made no extended experiments and am unaware of any having been made, but my experience of an average Kerry cow is that she will yield on an average 12 quarts of milk per day, and 10 to 11 quarts of milk will produce 1 pound of butter. Cheese-making is almost unknown in Ireland. The weight of the animals when fat is from 30 to 36 stone, of 8 pounds, and they frequently run up to 40 stone. My herd is kept on prime old pasture, which has been most judiciously "laid down," but the part the Kerry plays prominently in the agriculture of the country, is that they are bred by small farmers in the Kerry Mountains, where they have a temperature and climate much resembling that of the Welsh Mountains, and are kept in and about that district until they are from two and a half to three years old, when they are bought up in the local fairs in Kerry, and elsewhere, for the richer lands of surrounding districts; in fact, the popular idea is that if land is not good enough to fatten Shorthorn cattle, it will be occupied by Kerries.

Considering the utter neglect with which the Kerry have been treated, no method whatever being followed by their breeding, it is a wonder they are not extinct long ago. They are very easily kept. Two will consume very little more food than one large Shorthorn, and when crossed with it make both good dairy cows and butcher's beasts. My champion bull, Busaco, who has never been beaten in a show-yard and who obtained ten royal prizes (the one at Kilburn included), measured 68 inches in girth, 36 inches in height, and 34 inches from tail to top of shoulder. The Kerry cattle are extremely hardy, not liable to disease, are handsome, docile, pretty in the park or paddock, and excellent butter-makers. My cattle are never housed, cows in milk excepted, and they seldom get anything but grass and straw in winter. The points of the Kerry are, a small, neat, lively animal, light round frame, narrow rumps, fine bone, limbs rather long, fine small head, keen eye, white upstanding horns, with black tips. The popular color is jet black, but a few red and brindled ones sometimes appear.

We are indebted to Mr. R. O. Pringle, late editor of the Irish Farmers' Gazette, for the following:

The Kerry cow is a neat, light-made animal, with fine and rather long limbs, fine small head, lively eye, fine white horn, which in many cases after projecting forward is turned or cocked backward. The rump is narrow, and the thigh light. The fashionable color is pure black throughout, but some are black and white, and others red. The skin should have a mellow touch, and be well coated with hair. The Dexter variety is distinguished from the pure or true Kerry in having a round plump body, short and rather thick legs; the head is heavier, and wanting in that fineness which marks the true Kerry, and the horns are longer, straighter, and coarser. The real origin of the Dexter variety is not well understood, but it is supposed to be the result of special selection. In Ireland the Kerry is much esteemed as suitable for small villa farms, as the cows, although naturally active, are very gentle, and do well when tethered on confined bits of grass. They also thrive when kept constantly house-fed. We have known a Kerry cow to be kept for five years in a dark stable in Dublin without injury to her health. About 12 quarts of milk daily is an average yield for a Kerry cow when she is fairly kept [this is too much.—T. L.], and we have known some cows to give as much as 16 quarts daily for a considerable time after calving. The yield of butter is 1 pound from 11 quarts of milk, but we have known a higher percentage of butter obtained.

Kerry can fatten rapidly when required. This is true when they have been kept as cows or otherwise, for a time on fair pasture, but poor Kerries, especially bullocks, when obtained direct from their native mountain grazings, take some time before they begin to show improvement. When once they do begin to improve, their progress is rapid, and when slaughtered their flesh is of the best quality, fine in the grain and richly flavored. Their weight, when fat, is from 28 to 36 imperial stone. Extra-fed beasts will make 40 stone. With a few exceptions, the breeders of Kerry cattle have not until recently devoted much attention to the proper maintenance of the breed, and the fact that Kerry cattle have survived the neglect with which they have been treated, without material deterioration, is strongly in their favor. The Knight of Kerry has a herd of Kerry cattle which has been bred with great care for a long period, and other gentlemen in that part of Ireland have also devoted attention to the subject, but the reputation of the breed has been considerably enhanced by the interest which has been taken in it by various gentlemen residing in other parts of Ireland, who have taken up the breeding of Kerry cattle, not merely as a fancy, but from the intrinsic merits of the breed as dairy stock.

Mr. P. Chesney, in giving the results of very careful observation during his experience of the Kerry, says:

My cows were kept on the same farm and fed on the same pastures as a number of Ayrshires, Shorthorns, and common cows, the only difference in their treatment being that the large animals used to receive supplementary allowances of bean-meal, cake, and other dainties which were found at times to be necessary for them. I do not speak from memory as to the facts I am giving, having before me a register of the quantity of milk given by each of my cows, at that time 38 in number, during the months of one spring and summer, as also of the percentage of cream as tested by the factometer. I should observe, however, that the milk was only measured and tested once a week.

The farm on which the cows were kept, situated in county Cork, consisted of some 300 acres of by no means exceptionally good land, part of it indeed mountain, and other parts reclaimed bog, laid down in artificial grasses. Of course some fields were devoted to meadowing, and we had considerable facilities for investigation, while others produced grain and root crops, more of the latter, however, than the former. One kind of forage found especially useful, particularly for young stock, was French furze, which turned a piece of rough, stony ground into quite a profitable place.

Up to the time of my going to the farm it had not been the custom to keep much cattle there, and the cows, although good ones, were of no particular breed. But as butter fetched a good price, especially when carefully made, and dairying was more profitable in that locality than other kinds of husbandry, the stock was soon largely increased and Ayrshires and Shorthorns introduced. At one time we in fact had as many as 60 milkers besides a considerable number of calves and heifers. Having a strong suspicion, however, contrary to the views of our neighbors, that the little black cows of the adjoining county would prove quite as serviceable and much more economical in our circumstances than the larger breeds, it was resolved to give them a fair trial, and as we decided to start with good ones we made an expedition to Valentia and after inspecting the herd of the Knight of Kerry, became the owners of several good specimens of his prize-taking stock. But as these of course fetched somewhat higher prices, we also made some purchases from the farmers about, in particular that of one little heifer which became quite a celebrity. It was in autumn that we made our venture, and our little favorites having been carefully driven home and well housed and attended to during the winter, duly calved the ensuing year, with the exception of one of those bought from the Knight, which turned out a stripper, almost all of them being three or four year old heifers, and this their first time of calving.

Besides these pure Kerries we also bought 3 half-breds, the result of the cross between the Kerry and the Shorthorn which Mr. Mahony so strongly condemns, and I am bound to say that better milkers for their size it would be difficult to find. One of them, moreover, was quite a beauty and chosen on this account by an excellent judge who had some difficulty in persuading her owner to part with her, and I believe that a "first cross" between Kerry and Shorthorn parents, possessing the requisite qualifications, produces a very useful animal for a dairy farm, especially if it be one where the yield of grass is not very heavy, or where there is mountain grazing; for these cows not only give plenty of milk up to an advanced age, but fatten more readily and produce a larger amount of meat than the pure Kerry whenever it may be necessary to get them ready for the butcher.

The young Kerries, three or four year olds, with their first calf, did not (any of them) milk more than 7½ quarts in the day the first year, but those which were two years older gave 12 and 13 quarts, and even as much as 18 quarts soon after calving. A four-year-old half-bred, however, gave 10½ quarts. Now, as our best Ayrshires, large, heavy cows, which consumed a great deal more fodder than the Kerries, never gave a greater yield than 15 quarts and our heaviest milker among the Shorthorns never quite reached 20 quarts, even when receiving bean-meal mashes, &c., in addition to vetches and grass, I consider that the Kerries are decidedly the most profitable, particularly as they are industrious little creatures, wandering off to find food for themselves, and always contriving, if they meet with any fair treatment, to keep themselves in proper condition.

A pure-bred Kerry, too, with her sleek ebon coat and gracefully-shaped waxy horns, is a very pretty creature, and may almost challenge competition with her beautiful dove-colored sisters of the Pyrenees, though I doubt whether she would willingly suffer herself, as they do, to be trained to servile employments, and made either to plow and furrow or draw a cart of hay. Nor would it, in point of fact, be at all profitable to employ cows in this manner if we wanted them to give plenty of milk. Whether in years to come, peasant farmers may find it economical to use cows in that way is another matter. For my part, I believe that jennets, especially in Ireland, are better substitutes for the more expensive equine animal.

As to the cream-producing qualities of my cows, I found Shorthorns to give the lowest and common cows the highest percentage, Kerries and half-bred Kerries being second best, and Ayrshires next to them in this respect. It is needless to allude to a fact which every observant person who has to deal with cows will have noticed, that the yield of cream often varies considerably with the same animal from one week to another, and that from no appreciable cause, when no difference has been made in the feeding, and there has been nothing, so far as one could see, in the state of the cow herself to account for it. Of course, too, the creamometer is only a test of the quantity and not of the quality of the cream, and I had no other way of judging of the latter, save by its apparent richness or otherwise, which I used to note down.

Taking, then, these notes for what they may be worth, I find that with one exception, that of a seven-year-old cow, the cream from my Ayrshires was remarkably poor, that of the Shorthorns little better, that of the Kerries took the next place, and that the common cows gave the richest milk of all; but I am bound to say that the latter were almost all aged, and none of them less than 5 years old, and I have always found the milk of old cows much richer than that of young ones, although the contrary opinion is, I believe, more generally held. It would be interesting to know what is the value of the milk of the Kerry cow as compared with that of the Alderney or the Jersey. I imagine that on very good pasture the Channel Islands' cattle would bear off the palm, but that on poorer or on mountain land the Kerry would win the day.

As to Dexters I can pronounce no opinion. I had, indeed, a pair of these tiny creatures more as curiosities than for anything else. They are comical, but have no pretension to beauty. The Kerry heifer before mentioned became quite renowned in a certain northern locality, to which, much to her own surprise probably, she found herself transplanted. She was one of those purchased at Valentia, and owed her

> selection entirely to her remarkable appearance. Looking out of the window at my hotel one morning I saw a collection of animals which had been brought together for the inspection of the gentleman, who, it was to be hoped, would be soft enough to buy up anything that was presented to him as a "rale Kerry," and singled out from the group, and as it seemed in the act of being purchased, was so queer a specimen, that, running down stairs in alarm, and appearing on the scene of action, I began to remonstrate against the transaction. My protest, however, availed not. Cockle, as she was soon appropriately named from having been bought by the sea-shore, was selected for her oddity, and sent home with the rest, being not much to speak of as to body, but the owner of a long pair of wide-spreading horns that might almost have graced the head of a Spanish cow. Needless to remark, she was received by the cow-herd with little favor, and barely tolerated about the place as "master's fancy." By-and-by heavy trouble coming down upon the occupier of that farm, a change of residence was resolved upon and most of the live stock sold; but a mere nothing being offered for Cockle when she came to the hammer, she was bought in and removed, as I before said, to the north, where, after producing her second calf, the despised Kerry proved so excellent a milker, giving 20 quarts at first, and never, I believe, going below 12 or 14 until just running dry—her butter also being very rich and plentiful—that her reputation became so great as to cause her progeny to be in great request.
>
> This of course was all mere chance. With Kerries, as with all other live stock, the great thing is to choose well and continue to breed from the best subjects. The breed is capable of great development upon good land, for we have seen at Irish cattle shows, Kerry cows very little, if at all, smaller than good-sized Ayrshires; such, for example, as some of those bred by Mr. Brady near to Dublin, and as the meat of the Kerry is considered by connoiseurs to be particularly good, it may not be undesirable to take size into consideration, although this is a point that I personally should care little about. A really good herd of Kerries would be found, if I mistake not, in more ways than one, a profitable investment.

The first cross, however, between a Kerry and Shorthorn is not suitable for a severe mountain climate and poor pasture. The more Shorthorn blood that is introduced the better the cattle must be cared for, whereas, if the better care be bestowed on the Kerry breed the results will be more satisfactory for dairy purposes, and ultimately quite as good as regards increased size. The following are the results of some experiments carried out on the British Government's model farm at Kingwilliamstown, and will be read with interest. The elevation of the farm is about 800 feet, the pasture fine, the situation exposed, and the climate moist. The experiments were conducted for the purpose of ascertaining the relative value of Galloway, Ayrshire, and Kerry cattle for dairy purposes. The conditions, however, were not quite equal, inasmuch as the Kerry and Galloway cattle were heifers with their first calf, whereas the Ayrshire were with their fourth calf. The cows were all wintered on the farm, and from the published report it would appear they had nothing but hay. The quantity consumed by each breed was carefully noted. Each Galloway consumed $21\frac{1}{4}$ pounds a day, each Ayrshire $24\frac{8}{9}$ pounds a day, and each Kerry, $16\frac{8}{9}$ pounds a day. From this it would seem that the Kerry is easier fed than most breeds of cattle, and this assumption is supported by the opinion of those most conversant with the breed.

As regards the relative size of the breeds the report states that the Galloway cattle when fat would make about 6 cwt., the Ayrshire 5 cwt. to $5\frac{1}{2}$ cwt., and the Kerry 4 cwt. The milk was measured and manipulated separately from the time of calving to the 17th of June, and as regards quantity, with the following result: Each Galloway cow gave average of $6\frac{1}{4}$ quarts a day; each Ayrshire gave an average of 9 quarts a day; and each Kerry gave an average of $7\frac{1}{4}$ quarts a day; the Kerry and Galloway giving these quantities after their first calf, and the Ayrshire after their fourth calf. The same Ayrshire cows, three years earlier, after having had their first calf, gave only $7\frac{1}{2}$ quart a day each; that is, only half pint more than the Kerry cows under the same conditions; so that if we take the winter feeding as a fair test of the relative proportion of food required by each breed, the Kerry cattle gave a larger yield of milk for the food consumed than either of the other breeds. It was, however, in the quality of the milk that the Kerry cattle especially excelled. It took 9½ quarts of milk from Galloway cows to make 1 pound of butter, 10⅕ quarts of milk from Ayrshire cows to produce 1 pound of butter, and 8⅞ quarts of milk from the Kerry to make the like quantity. It would be most interesting to obtain an accurate record of the produce of Jersey and Kerry cows under similar circumstances, but admirers of Kerry cattle could hardly expect their favorites to make more than a decent stand against the Jersey cattle, seeing that the latter have been carefully selected for their dairy qualities for generations, whereas the pure Kerries have only saved themselves from extinction by their extreme hardiness and power of existing on the poorest mountain pasture.

It is claimed for the Kerry that it possesses inherent merits of a very high order, and that these merits are apparent in a large percentage of the individuals of the breed. By carefully selecting good annimals, and breeding from them only, there is no doubt that the breed can be raised to great prominence. It will always be specially suited to light lands, but when further developed, it will be found to give a fair return for better feeding.

(10) AYRSHIRE CATTLE.

History.—The Ayrshire breed of cattle, a race of dairy stock of rare uniformity of stamp and character, have long been in existence as a breed distinguished from all others. As their name bears, their origin is traceable to the county of Ayr, in Scotland, but the date of the early development of the breed (early it must have been) is uncertain. Mr. Acton, of Strathaven, in his report on the county of Ayr in 1812, referring to the adage—

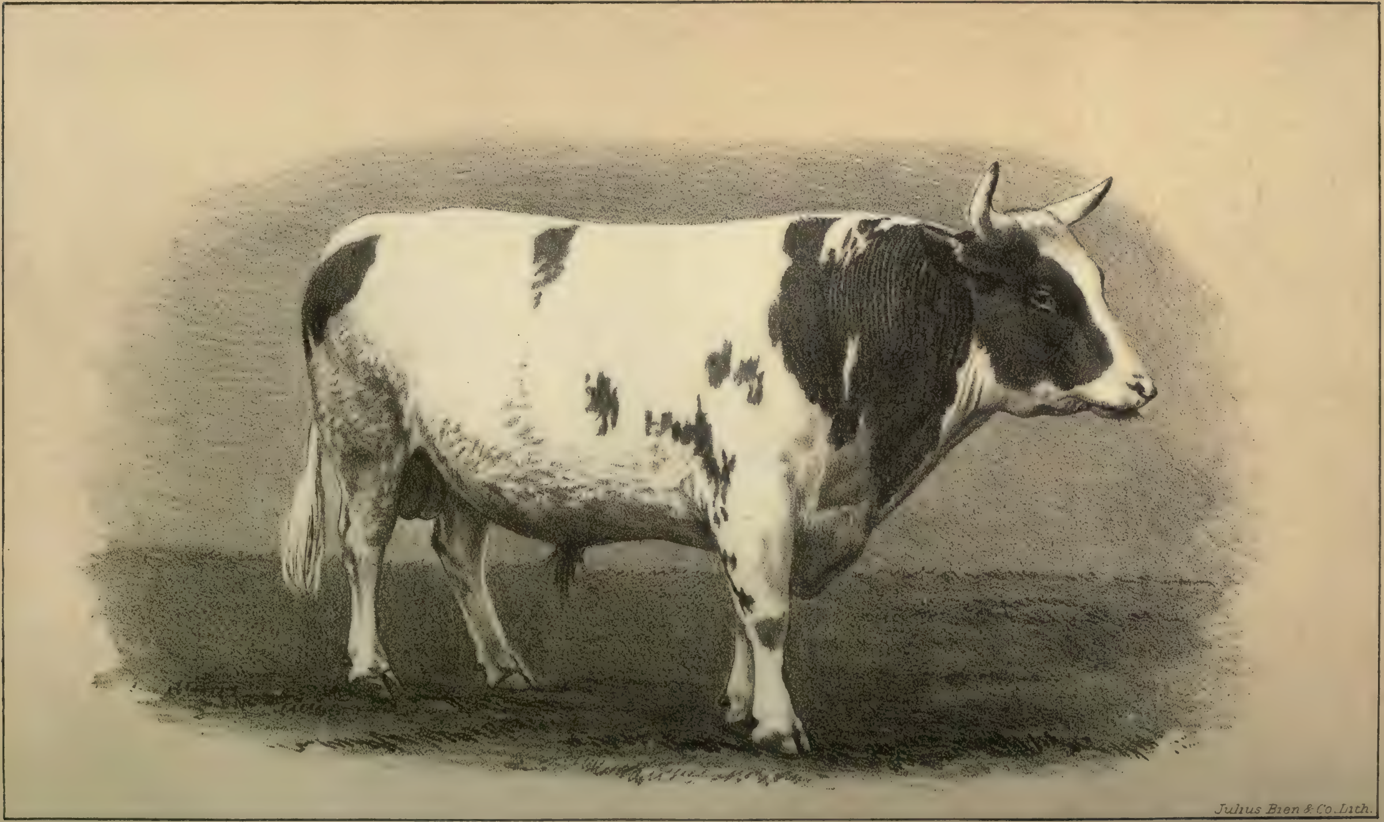
Kyle for a man,
Carrick for a coo,
Cunningham for butter and cheese,
And Galloway for woo,

says that it is of unknown antiquity, and certainly much older than the Revolution. Kyle, Carrick, and Cunningham correctly describe the features of the three divisions of Ayrshire. Cunningham, the northern district, was remarkable for dairy farming, the stock consisting of the kind long familiarly known as the Ayrshire breed. The parish of Dunlop is the principal one in the northern district, and Colonel Fullerton, in his report on the county of Ayr, dated November, 1793, referring to the Ayrshire cattle, says:

> They were originally long known as the Dunlop breed, either from the ancient family in Dunlop Parish of that name, or the parish itself, in which they were first brought to perfection, and where still continues a greater attention to milk-cows and dairies than in any other part of Scotland.

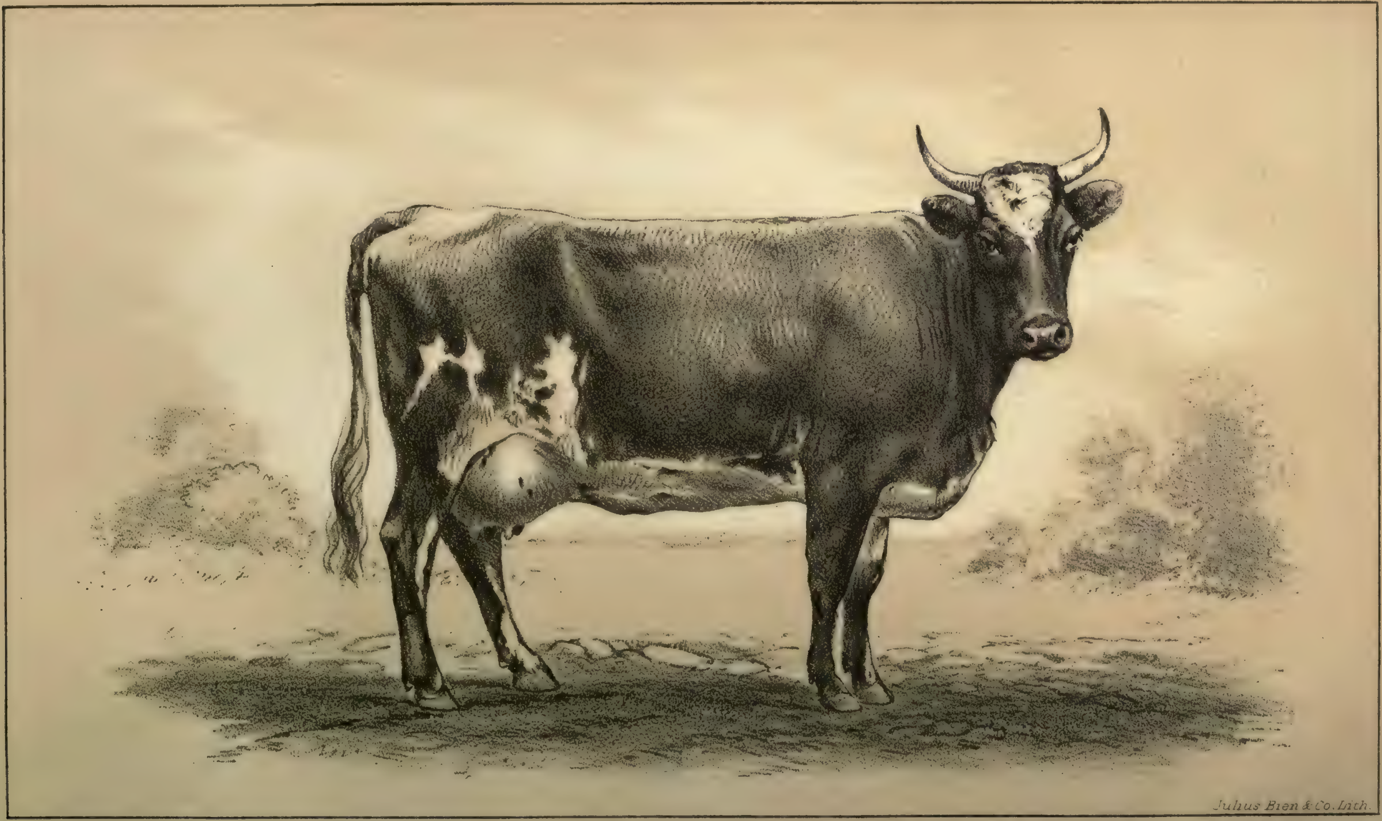
The antiquity of the breed, dating back many centuries, is thus clearly indicated, and not less the fact, with which its history has from the earliest period been associated, that attention in breeding has always in a peculiar degree been directed to those characteristics which indicate the qualities of producing milk. In this manner the distinctive characters of the race as being the most noted class of dairy cattle has been established. Attention in the end of last century was directed to the breed through the large number of exhibitions which were formed for the purposes of promoting and improving the breed. They were

PLATE 16



Julius Bien & Co. Lith.

Mr BARTLEMORE'S AYRSHIRE BULL.



Julius Bien & Co. Lith.

Mr DREW'S AYRSHIRE COW.

[illegible] 914 [illegible]

the first and at the time the only native breed of stock in Scotland which the National Agricultural Society distinctively recognized for encouragement as breeding stock by the offer of premiums for such at that society's first general show at Glasgow in the year 1826. Originating in dairy districts, they have been almost exclusively bred for dairy purposes, but statistics show what perfection the breed might attain for the purposes of the butcher.

In the counties of Ayr, Renfrew, Wigtown, Lanark, Sterling, Dumbarton, Bute, Argyle, Dumfries, Kirkcudbright, and Perth they form the only class of dairy stock, but they are sought after earnestly by dairymen in all the other counties of Scotland, throughout England, and now Mr. Ferme has established a large and eminently successful dairy of them in the very midst of South London. They are annually exported in large numbers to Sweden, Australia, New Zealand, America, and other countries. The dairies of them in Scotland range in numbers from 15 to 100, but now Mr. Hoggan has formed one of 300 at Busby, 6 miles from Glasgow.

Color.—The prevailing color is brown and white, spotted, flecked, or mixed with white, but inclining, as a rule, mostly to the brown. Many breeders incline to the pure dark-brown without any white. In the show ring in recent years the fashionable and stylish color has been pure white, with splashes of brown on body, brown neck, brown on the sides of the head, and white face. Breeders aim at fine, thin-skinned animals, soft and mellow to the touch, with nice, long, silken hair; and in obtaining these ends it has, in my opinion, been most justly conceived that white-haired animals are most prone to these qualities. I think the prettiest specimens of the breed and the best types are to be found in those whose bodies are dark brown and have pure-white hind legs, white-udders, and white tail. These sorts, in my experience, have proved the best milkers and surest fatteners. Very few dairies there are which have not a black and white specimen of the breed. That color is not rare, and they are always found good milkers.

Characteristics.—In my opinion the following constitute the leading points in the Ayrshires: Large nostrils; short head, from eyes downwards; large, full, and lustrous eyes, set well forward in head; broad brow betwixt eyes, gradually widening upwards to its full breadth betwixt the horn-roots; horns widely set apart and inclining entirely upwards, and white with black points; horns of bull not so highly set and of fair thickness; neck, at the back of the horns, level, and extending straight back to shoulder-bone, the back continuing in a straight line to tail-root; no dewlap; body round heart-line extending in a gradually deepening line to the flank; shoulder-bone high and thin, rising above the blades, the blades being well set and not working when the animal is in motion; part of body behind shoulder level; back broad; torrs broad and pointed and equidistant betwixt second fore rib and and tail-root; ribs well sprung from backbone downwards; calving bones by no means wide; tail well set in; deep, well-filled thighs, extending in a straight line downwards and reclining low in the body at the flank; whole body set on short legs; long hair; soft, mellow skin; fine bones; whole contour level; body full of substance and symmetry; animal sprightly, with fine escutcheon, and showing nobility and grandeur of gait; in cows the milk-vessel should be broad betwixt hind legs, well caught up to body, large and level on sole of vessel and extending forwards far on to belly; teats well and proportionately planted.

Maturity as milkers.—The Ayrshire cows are at full maturity by producing a calf the month in which they reach three years of age, but many breeders, however, choose to have their heifers in milk at two years of age. In my experience this retards the growth and full development of the animal, alike in size of carcass and milk-producing power, but not to any very great extent unless the heifer is kept too long a-milking. The commercial average value of calving cows, taken all the year round, as sold in markets and at public sales for dairy purposes is about £21. Such cows when done with at the dairy fatten well on grain alone and average in live weight 8½ cwt. Cows destined for dairy purposes are never highly fed till they are in milk—grass alone in summer, and hay or straw alone in winter. It is considered that they thus develop their milk-vessels and milk properties much better.

Maturity as meat-producers.—Statistics show to what perfection the breed might attain if cultivated for purely fattening purposes. Mr. Lawrence Drew, of Merryton, lately exposed and sold a large number of calves, ten months old and then sucking their mothers, at from £18 to £25. I have sold in Paisley by public auction a two-year-old heifer to the butcher at £30. Two oxen of the breed exhibited some years ago by the Duke of Montrose gained the first prize at the national show as the best fat animals. They were aged, respectively, five and a half and four and a half years, and being of uncommon weight were sold to the butcher for £120. Two-year-old oxen of the breed fatten well on grass alone, without cake, and average 20 stone. Bulls reach their full growth at three years, and exhibit in a pre-eminent degree when fed all through these years the weight to which the breed might attain. The average live weight at that period from my experience is 16 cwt., dead weight 11 cwt. At five years of age I had one killed at York this year—winner in his class—live weight 19 cwt., dead weight 13 cwt. The bulk of bulls in this country are fed off and killed at two years and nine months. They average in dead weight 21 stones.

Housing and handling Ayrshires.—The breed is an exceptionally hardy one, so far as climate is concerned, for many, if not the majority, of breeders allow their calves and one-year-old heifers to lay out all winter, merely sheltered by natural plantations and receiving one sheaf of straw or hay each per day. For my part I find they do extremely well in this manner and start growing far earlier in the spring than those pampered in houses. All exhibitors of the breed contrive, although putting the animals under roof, to have them in open and exposed houses so that they may come out well haired. Bulls of all ages are generally kept in loose boxes, part of the box only being roofed. Calving and milch-cows are always kept in well-ventilated byres. The breed, as a whole, is an extremely easily handled and managed one, I might almost say of some intelligence. At milking time, either morning or evening, at the appointed hour you find the cows at the gate ready to be taken in, and even in a byre of some hundreds a cow after one week never mistakes her stall.

Feeding Ayrshires.—As I have said, young cattle are never better than when till two and one-half years of age they never see a halter, giving them milk for two months as calves, then grass; in winter, one turn per day of hay or straw laid down on a clean bit of pasture, with probably the addition of some little oil-cake. For show purposes I find the best feeding is, for both morning and evening, cut bog hay steeped with bran and warm water, with one handful of bean meal, and in the middle of the day pulped turnips or oil-cake and bog hay. What we aim at is cold feeding. They should be given the very smallest quantity of meal and oil-cake, as they in my experience tend to put on flesh upon the neck, and thereby spoil the first point in the breed, viz, a thin neck. I have a year-old bull just now, or rather aged one year and six months. He won eight first prizes last year, including the royal, and never saw meal or oil-cake till January, 1884. His first show turn out this year will be on 11th April next. Milch cows in summer as a rule receive nothing for five months but grass; but some very few give them a little bean meal at milking time. In winter milch cows require warm feeding; cut hay boiled with turnips and bean meal is the most common.

Breeding Ayrshires.—The great aim of breeders has been to perfect the race for dairy purposes, and that quite irrespective of size and substance of body. We have been contriving through many years past to breed milk vessels irrespective of bodies. What we want is a broad milk vessel behind, well caught up to the body, with long reach onto the body and level sole, with teats not over large, well and evenly set on milk vessels, and having broad points. That is almost all which has been looked at for a long time, and really breeders have suffered considerably. Such animals have not as a rule commercial value. Many now see the folly and are breeding large, substantial bodies irrespective of milk vessel.

One consideration has militated against breeders being so generally successful in producing perfective milk vessels in the fact that the animals are not in milk till three years of age, till in fact they have proved themselves, and then probably the bull is dead—an animal which might have been of incalculable service to the herd. Few keep their bulls, except for show purposes, over two years. Above that age breeders consider they are rather heavy for the cows and leave calves which are sore on the cows. The bulk prefer stirks to any other age for their cows. In my experience this is wrong. The bull leaves the impression, and when one gets a good one keep to him. I had one five years old, and as a three-year old he bulled 80 cows and 80 as a two-year old and more as a five-year old, and no man living can say he ever left a bad one. He was a true strain himself, and hence the results. His progeny have been all the leading winners the last few years and will be this year again. We must and will now aim at breeding more for size and substance of body.

The Ayrshires as milkers.—We are not great statisticians, but the dairy show in London proves that for quantity and quality of milk the Ayrshire beats all breeds. Mr. Ferme, from his Ayrshire dairy in South London, with animals bought in the district of Paisley, is now almost annually the winner of the lord mayor's cup for the best dairy cow in the show. That prize is tested by quantity and quality. I have an average of a cow for two years in succession giving 11,100 pounds of milk per year, and of 12 little cows in the five grass months of summer giving 480 pounds of milk per day. I should say that in a fairly good dairy the average pounds of milk per year would be 10,000 pounds. I have tested cows in midsummer and found they gave 12 pounds per week of butter, and a fair average for the year would be 400 pounds, providing always that good grass in summer is given and good feeding in winter.

Near populous places many farmers sell their own milk and butter from the cart. They realize per cow about £21 per annum; and a bulk of the farmers in the district of Paisley let their cows for the year on lease. The party who takes them on a lease is called a "Bower," and is supplied with grass for the cows in summer and food in winter. He milks the cow, supplies his own utensils, horse and cart, and pays on an average per annum per cow £18. As I have suggested, statistics are scarce, and exact data as to the quantities of milk required to make a pound of butter and a pound of cheese have probably not been recorded.

My dairy-woman, however, tells me that a fair average quantity of milk to 1 pound of butter would be 24 pounds, and this, too, in the summer months, when the cows get nothing but grass. From a given quantity of food the Ayrshire breed gives a greater quantity of butter than any other, giving more milk and retaining a far better condition of health.

I may also state that the very best-fattened Ayrshire steer shows a proportion of meat at maturity of 68 to 71 per cent. The Duke of Montrose's prize steers were said to exhibit 80 per cent. An Ayrshire steer is an extremely kindly feeder, and becomes at a period of from twenty-four to thirty-six months superior beef, if well kept throughout, with a live weight of 1,100 pounds to 1,250 pounds. A cow fattens quicker and to a greater degree of perfection than any of the rival breeds for the dairy. The soil in Ayrshire, where the breed was brought to perfection, is of a stiff, clayey nature, exhibiting throughout a substratum of limestone, coal, or iron-stone. Near the coast it is sandy. In Renfrewshire the soil is variable, some parts being of a light nature with a rocky bottom, and others being like that where the breed was perfected, of a stiff, clayey nature. The grasses chiefly cultivated—nay solely—are perennial: rye grass, timothy, and red clover.

The Ayrshire cattle have never, like some other breeds, been used for draft purposes. They are too beautiful and profitable to be applied to such purposes. A fact, and a scientific one, too, is that the milk of the Ayrshire is healthier and sounder than that of any other breed, while it keeps fresh for a longer period and is more easily digested.

Experience of Ayrshire breeders.—Mr. David Allan, M. R. C. V. S., who has had considerable experience among Scotch dairies, says:

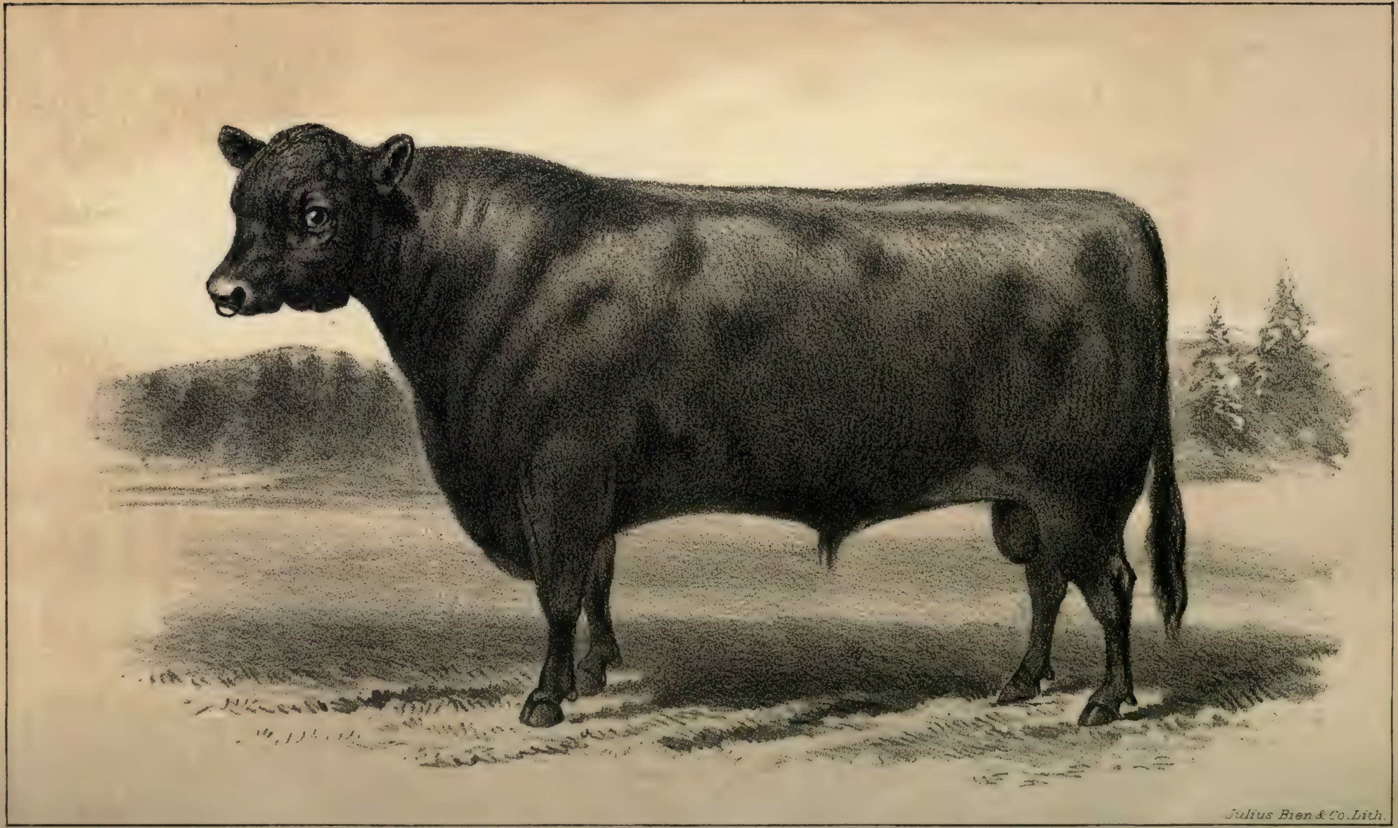
> A good Ayrshire cow will give annually about 750 gallons of milk, which will produce about 275 pounds of butter or 550 pounds of cheese. It, however, does not arrive at maturity for full milking until five years, although three years is reckoned to be the age. When at maturity at that age (three years), the live weight of a good heifer is about 11 cwt. and the dead weight of flesh about 5½ to 6 cwt., to which, in the case of a bull or ox, add a fifth. The soil is mostly of a light red marl on limestone or sandstone. The grasses that are cultivated are chiefly rye grass, timothy, and the different clovers. I do not know of any Ayrshires being used for the purposes of draft. The system of feeding these cattle is, cooked food in winter, such as chaff, turnips, bean meal, draff, and cabbage, and grass in summer for milch cows. Feeding stock have turnips and oil-cake along with hay. With regard to housing, the young cattle go loose, whilst the feeding and milch cows are tied up. We visited a dairy of 300 Ayrshires in Mr. Allan's district. The work was all done by girls. The milk is sent to Glasgow. The food is mixed in coppers and given hot in winter—grains, chaff, and roots. They yield about 10 quarts a head; breed tolerably well. The country is bleak and cold; soil heavy. Size and other particulars as shown above.

Another writer, in referring to the Ayrshire, says:

> Ayrshire cows, from five to seven years old, which are full fed in town and surburban dairies, are almost invariably fat after being milked and fed from nine to twelve months. They, however, are not in such forward condition as Shorthorns would be under similar treatment, yet for the same quantity of food put through the bodies of a certain number of animals of a given value no breed will produce the same amount of milk as the Ayrshires. There is, however, this drawback, and it is agreat one from a town or suburban dairy-farmer's point of view, viz, that if the cows are bought at the calving and sold fat when dry, they seldom make as much as fat beasts as they did as calvers; whereas with the Shorthorn as much, if not more, is made. What money value, however, which the Ayrshire lacks as a butcher's beast it makes up in milk. Under all other circumstances where the cows are not sold as fat, after a year's use, but kept on for the dairy for a number of years, the position of matters is completely changed, for the loss which might be incurred between the buying price as a calver and the selling price as a fat beast is spread over several years instead of being borne by one.

LIBRA[illegible]
OF THE
UNIVS[illegible]
OF
CALIF[illegible]

PLATE 18

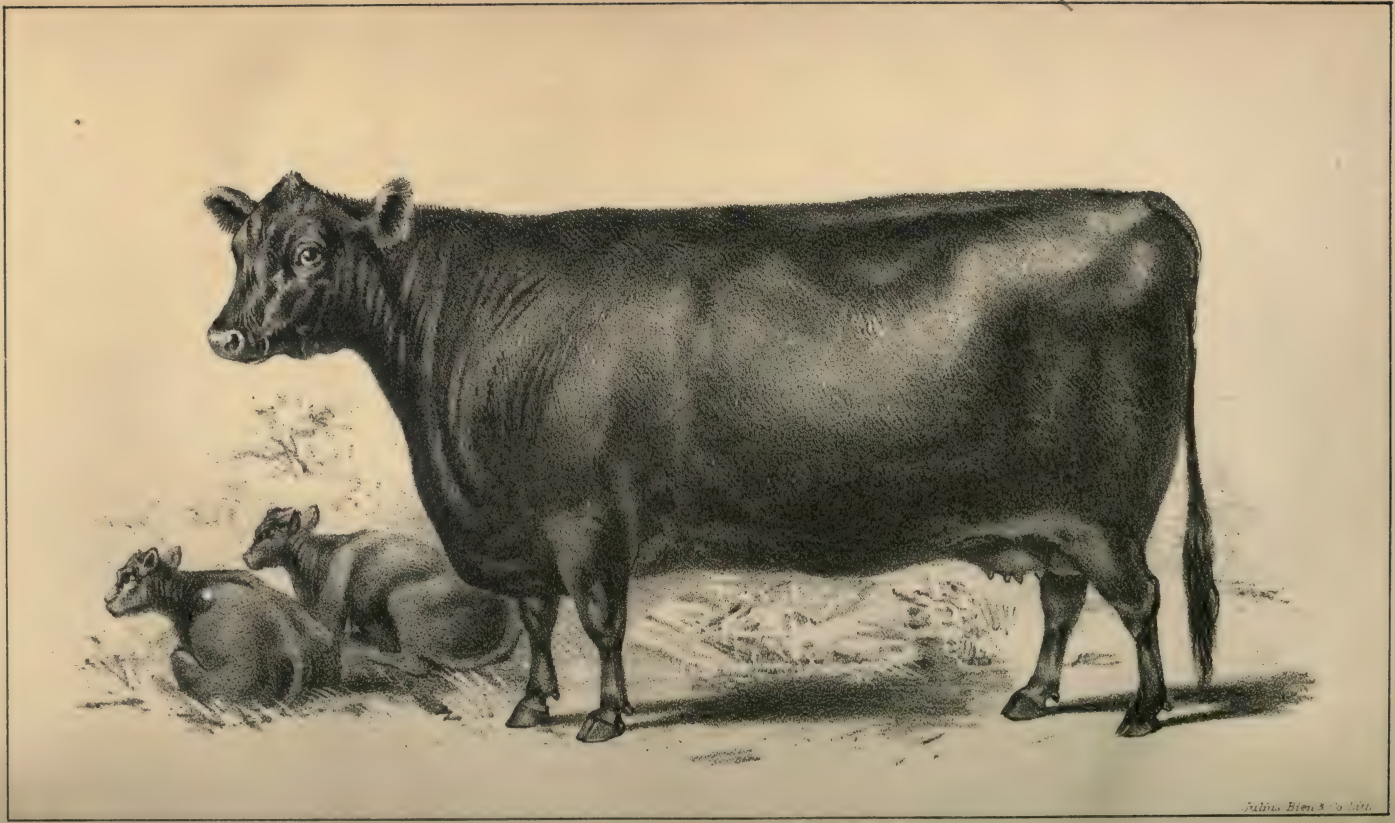


Julius Bien & Co. Lith.

ENGLISHMAN, AT 18 MONTHS OLD

THE PROPERTY OF C. STEPHENSON BALLIOL COLLEGE FARM
LONG BENTON NEWCASTLE ON TYNE

PLATE 19


Julius Bien & Co. Lith.

"PRIDE OF ABERDEEN" AT 4 YEARS OLD

WITH HER TWIN HEIFER CALVES "PRIDE OF BALLIOL" & "PRIDE OF BENTON" THE PROPERTY OF
C STEPHENSON, BALLIOL COLLEGE FARM, LONG BENTON, NEW CASTLE ON TYNE

The Ayrshire is, moreover, far more hardy and will thrive under circumstances where the Shorthorn would perish. This is well illustrated by the immense drafts of Ayrshires which have gone within the last few years to Sweden, Norway, and Finland, and from personal intercourse with natives of these countries I find their idea of the Shorthorn as a dairy cow is low compared with the Ayrshire. I annually pass a considerable number of both through my hands, and have come to the conclusion that the milking qualities are more regularly developed in the Ayrshire than the Shorthorn. Some Shorthorns are as good milkers as any Ayrshire could be, but they are extremely few, whereas it is the few Ayrshires that are not milkers and the many that are. Both breeds, however, I think, might be greatly improved as general dairy cows by judicious admixture of the good qualities of both. For milking and feeding I certainly prefer a cross by the Shorthorn bull with the Ayrshire cow to the pure breed of either, simply because it generally milks equal to the Ayrshire and better than the Shorthorn, and feeds equal to the Shorthorn and better than the Ayrshire. In carrying this out in practice, I generally buy Ayrshire cows and put them to a pure Shorthorn bull, keeping the cross female calves for my own stock and selling the males in the feeding districts, where they bring a price equal to that of any other. By this means I consider I make the most out of the good qualities of both.

(11) ABERDEEN OR ANGUS POLL.

Mr. Clement Stephenson, well known as a large prize taker, says:

Having for many years been engaged in a large veterinary practice, with special opportunities for forming an opinion on the merits of the different breeds of cattle from a professional point of view, and having for the last eleven years been a farmer and feeder of stock, I believe this breed of cattle stands pre-eminently forward both to the farmer and the butcher as being hardy and healthy, a good milker, both in quantity and quality, easily fed, a good beef producer, coming early to maturity, and highly prized by butchers.

Having devoted considerable attention to feeding cattle, both for market and show purposes, I was often struck with the excellent specimens of the Aberdeen cattle I saw, and I resolved to give them a trial. In the spring of 1877 I bought a young heifer of the breed in Buchan, Aberdeenshire, and, although only in ordinary condition when purchased, she improved so rapidly that, at Newcastle fat stock show, December, 1877, she took first prize in a class for heifers of any age; and, at the Smithfield show, 1878, she obtained first prize in her class and was reserve number for the Scotch cup. A second heifer, which I bought from the same breeder, took a similar position in the Northumberland and Smithfield shows of 1880. In September, 1880, I bought two yearling Polled steers from Mr. Bruce, Mid Clova, and with one of these sent out to show on November 14, 1881, when only two years eight months and nine days old, weighing 19¾ cwts., I gained first prize at Norwich; first at Leeds; second at Birmingham, in class for steers not exceeding four years of age; and second at Smithfield to Sir W. G. Cumming's champion ox. With the other steer, I obtained first at York and second at Hull. The progress these pure Polls made in weight and the high price they sold for, in comparison with specimens of other breeds I was feeding and showing, convinced me that they possessed all the good qualities the late Mr. McCombie claimed for the breed.

In my first season, when I had pedigree Polled cows, I was much struck with their aptitude to fatten. They were grazing in the same fields with other well-bred colored cows, all were suckling calves, and while the blacks were full of flesh and in splendid condition their fellows were so lean that I had to instruct my bailiff to give them a liberal supply of cake. The more I see of this breed of cattle the more I am convinced of their great value. They are, it is well known, able to live and look well on a poorer class of land than many other breeds, and yet they repay, in a very marked degree, any attention they may receive either by putting them on good land or giving them extra feeding.

There is another and most valuable advantage these cattle possess, namely, their remarkable freedom from tubercular disease—a disease that has caused great loss and made sad havoc in many a herd, and a disease, the importance of which in a medical point of view (viz, its communicability to man), is now attracting much attention. Of course I cannot assert that it has never been known or seen in this breed of cattle; but this I can say, that although I have had special opportunities for research, and have examined great numbers of cattle, both alive and *post mortem*, I have never yet seen a trace of it in this breed.

Mr. Lyell, of Dundee, says:

The now celebrated Polled, or Hornless, cattle of Forfarshire, long familiarly known as Angus Doddies, were probably originally introduced into Scotland from Norway. They were formerly known in the neighborhood of Dundee as Humble Cattle, a name synonymous with that used in Aberdeenshire, where a somewhat similar breed were called Bucan Humlies. According to Mr. Bernt Petterson, Norwegian consul at Dundee, Polled cattle are very common in the southern parts of Norway, while in Tronso, within the Arctic Circle, they also exist in considerable numbers, as I have been informed by Mr. John Neish, who was there in 1879.

Iceland has also a breed of Polled cattle, noticed by Dr. Uno Von Troil in 1772. He said that in his time the country was well provided with cattle, which were generally without horns, and that their beeves were not large but very fat and good. It had then been reported by some, though without foundation, that there were none of them with horns, but it was more true to say that such were seldom kept. Mr. Neish, who was in Iceland in the summer of 1881, says that the cattle there still agree with this description. It is reasonable to suppose that both the Icelandic and Scotch breeds were originally derived from the Norwegian; but, on the other hand, it cannot be denied that the same natural law of variation that produced hornless cattle in Norway, or where the Norwegian breed originated, could act on any breed. In addition to the Angus and Buchan Polls, now to some extent intermixed in all the best herds, there are two other British breeds of Polled cattle, viz, the Galloway, in the south of of Scotland, and the Norfolk and Suffolk Red Polls. The Galloway had enough resemblance to the Angus breed to have been included with it in the early volumes of the Polled Herd-Book, but each has now a herd-book of its own. The Norfolk and Suffolk breed is said to have originated chiefly from a mixture of Scotch Polls with the Old Horned breed of cattle of these counties.

Coming to historical evidence of cattle breeding in Angus, the earliest I know of is that contained in Ochterlony's description of the shire in 1684–'85. He says:

"Great abundance of cattle, sheep, and horses, especially the brae (hill) country, who have great breeds of cattle; and in all the laigh (low) country for the most part, except in some few places where they are short of grass, all breed as many as sufficiently serve themselves, but the chief breeds in the shyre are the Earls of Strathmore, Southesk, Panmure, and Edzell, Powrie, Balnamoone, both for horses and cattle.

"Both these parishes, Kinnaird and Farnell, belong entirely to the Earl of Southesk, wherein are ane excellent breed of horse, cattle, and sheep.

And, when writing of the Earl of Panmure, he says:

"He hath at Panmure a most excellent breed of horse and cattle."

Thus there is evidence that cattle were carefully bred in Angus two hundred years ago, and although it cannot be ascertained from any record at my disposal that these excellent breeds were polled or dodded, it is probable from the sequel that they were so; at least, those who have asserted that no particular attention was given to cattle breeding in Angus before the beginning of the present century are certainly wrong.

The late Mr. William Fullerton, whose name will be always associated with the improved breed of Angus cattle, left a report on the subject, in which he says that the Lord Panmure who succeeded to the estates in 1787, in his sixteenth year, was the first to try to improve the Polled cattle of the county, and that he always showed much favor for them, even during his minority. He tried the experiment of crossing the Galloway and Angus cattle, but the result was unsatisfactory, and this line of breeding was at once abandoned. He afterwards was successful in his efforts in another direction, but in the mean time the late Mr. Hugh Watson, of Keillor, on entering that farm, in 1808, at once began a systematic experiment of the Angus Doddies in which he was so eminently successful that his name is now regarded as the chief one in connection with pedigree stock of this variety. His father, who had bred these cattle before him, gave him six of his best and blackest cows and a bull on entering Keillor, which he soon afterwards increased by the purchase of ten heifers and a bull at Trinity Market, Brechin. These heifers came from the parish of Farnell, where the Earl of Southesk had an excellent breed of cattle about one hundred and twenty years previously, and the bull was from Scryne, near Arbroath. From this stock Mr. Watson produced the Angus Doddies, which made his name famous throughout the country.

The improved Angus cattle had reached such a degree of perfection in 1848, that the judges of the Highland and Agricultural Society's show held that year at Edinburgh expressed the opinion that "the highly improved portion of this much famed breed is not surpassed by any other description of cattle, in the equal way in which the fat is mixed and diffused over every part of the animal, or in yielding to the butcher a greater quantity of prime meat in proportion to the weight of the carcass."

In conclusion, I may say that I think it a great mistake to confine them to one color—black. They were formerly of many colors besides, such as black with brown muzzles and brown streaked backs, red, yellow, and brindled. Long as they have been bred to black, they still throw reds and yellows, which are discarded as unfashionable, while, as every breeder of domestic animals knows, off-colored and mismarked produce is often the best in other respects. Variety of color is pleasing to the eye, and if the ignorant idea that red and yellow Polls show impurity of blood were got rid of, herds mixed in color would soon be common and admired.

It is claimed, says James Macdonald, that the northern Polls surpass all other races of cattle in the production of beef. On that point there is, of course, considerable difference of opinion, for at the present day, when the beef-producing properties of our other leading breeds, notably the Shorthorn and Hereford, have been developed to so high a degree, it could not be expected that, with anything like unanimity, any one breed would be accorded the premier position. Be that as it may, the Polled Aberdeen or Angus breed may, perhaps, be said to be inferior to none as all-round beef-cattle, and superior to all others in some respects. The brilliant and unequaled position it has latterly taken, alike in the show yard and market place, sufficiently establishes its claim to that description. It may be noted that at the Paris Exhibition in 1878 it carried off every single honor for which it was entitled to compete, including the £100 prize for the best group of beef-producing cattle in the exhibition, and that in British show yards, both as fat stock and breeding, it has attained to a leading position. In a strictly butcher's point of view, it has seldom to yield to any other race of cattle. The superiority over most other breeds, for the butcher's purpose, lies mainly in the excellent quality of beef, and in the high percentage of dead meat to live weight. As a rule, the beef of the northern Polls is very well mixed, and contains a greater proportion of compact, finely-grained flesh, and less soft, coarse, fat than most other kinds of beef. Inside, the carcass is usually well lined with fat of the finest quality, while in the density and quality of the carcass itself the breed may fairly enough claim the premier position among all our leading breeds of cattle. Some place the small Devon breed alongside, if not even before it, in this respect; but with that exception, probably, no other breed in the British isles will, on an average, yield so high a percentage of dead meat to live weight. In butcher's phraseology it "dies" well and "cuts up" admirably. In all the leading fat-stock markets in the country the breed is held in high estimation, and generally commands the highest prices, in fact, usually a higher price in comparison to its size and live weight than any of the other leading breeds. This is especially the case at the great Smithfield Christmas market in London, where the plump compact Polls from the north never fail to find a ready sale at the highest quotations.

The Aberdeen Poll is not a milking breed, being especially cultivated for beef, and it has been found impossible to obtain figures with any degree of accuracy showing the quantity of milk given per cow, or the butter and cheese value of the milk. We cannot indeed hear of a single case in which a more than ordinary dairy is composed of this race. With regard to size and weight for age, a few figures from the last Smithfield show will be found a sufficient guide. The first-prize steer at the age of two years ten months weighed 16½ cwt., and second-prize at same age 16 cwt. The first-prize steer at three years eight months weighed 21 cwt., and the second, at three years six months, 18½ cwt. The first-prize heifer at two years eight months was 17½ cwt. The Birmingham show figures were as follows: The first-prize Polled steer at the age of three years eight months weighed 18¼ cwt., and the second-prize at the same age 20¼ cwt. The first-prize heifer, also of the same age, weighed 16¾ cwt., and the second, two years eleven and three-fourths months, 15¾ cwt.

This race is perhaps the best of all others for crossing with the Shorthorn; indeed, the most marvelous specimens of cross-breds shown at the London and Birmingham shows are always of this cross. At the latter place the first prize steer, aged three years seven months, weighed 18 cwt. The first prize steer, aged two years eleven months, was 17½ cwt.; and the second prize, two years eight months, 17¼ cwt. The first prize steer at two years five months weighed 14½ cwt., and the second at on year eight months gave the marvelous weight of 16½ cwt. At the London show one of the prize cross-bred steers at twenty months weighed 13 cwt. The first prize steer at two and three-quarters years weighed 17½, and the second prize at two years eight months, 17 cwt. Another first prize at three years eight and theee-quarter months weighed 19¾ cwt. The first prize heifer at three years eight months, 17¾ cwt. The district in which the race is bred and fed, although not the bleakest in Scotland, is still much exposed; and the pasture is certainly not the best, but what is missing in the field is made up in the manger, for the northern farmers find it to their advantage to feed their cattle well, and especially upon cake. The race is not used for draft purposes."

Mr. G. Wilken, says:

With regard to the annual average pounds of milk which the cows give, and the quantity necessary for the production of butter and cheese, no such records are kept in Scotland. The breed is a beef-producing one, and has been so for many years. There have been noted instances of good milkers in the Aberdeen-Angus breed, but for many years Aberdeen and Angus have been feeding districts. The late Earl of Avilie, of Cortachy Castle, gave particulars of a newly calved Aberdeen-Angus cow, which gave 14 Scotch pints of milk per day; and of another, three months after calving, which gave 12 Scotch pints. A Scotch pint is equal to three English pints, so that these quantities give 5½ gallons per day for the newly calved cow, and 4½ gallons per day for the one three months calved, equal at 10¼ pounds to the gallon to 56 and 47 pounds of milk per day, respectively. With ordinary feeding the weight of cows at maturity would vary from 1,100 to 1,500 pounds, the dead weight of these being about 7 to 9 cwt. Many cases at Smithfield exceed 2,000 pounds live weight. Bulls, if fed well all their lives (which they usually are), weigh from 2,000 to 2,400 pounds at maturity. With reference to the age of the cows, they have been known to live over thirty years, and it is not uncommon to find some of the age of twenty years which are fresh and breeding. The proportion of meat at maturity of a fattened steer varies from 60 pounds per 100 pounds of live weight, to as high as 73 pounds per 100 pounds. The average steer in the Aberdeenshire district at two years and nine or ten months, when most of them are sold, weigh from 7½ to 10 cwt., dead weight. The soil of the district is poor and cold, but has been greatly improved by draining, liming, &c., and the grasses mostly cultivated are rye-grass, and red, white, and alsike clovers. Many of the cattle are still used for draft purposes, especially in plowing and breaking up new land. Aberdeenshire was mostly reclaimed by the "twal oxen plow," managed by two men, "a plowman and a gansman," and an old saying illustrates best how farmers thrived in olden times, viz:

"He that by the plow wad thrive
Maun either haud or drive."

That is, must either hold the plow or drive the oxen. The system of feeding varies somewhat in different localities, but the following is the most common, viz: From 1st to 10th May to middle of October the cattle go out on the grass in inclosed fields, but feeding-cattle are turned into the house a month earlier. From the middle of October to May the cattle in Aberdeen and Banffshire are generally tied up by the neck. In Moray and Inverness, north of Aberdeen, young cattle are fed in covered courts. The feed, in each case, turnips and oat straw only. In some cases young heifers and bulls get from 1½ to 2 pounds of linseed cake daily after weaning till early spring. The reason so little is known as to the milk-producing properties of the race is because the calves mostly all suckle their dams from five to six months, when the cows are allowed to dry off.

(12) SHETLAND CATTLE.

Perhaps the least-known race of cattle in Great Britain is the Shetland, which is by no means a large one, and is almost entirely in the hands of one great nobleman, the Marquis of Londonderry. We are unable to obtain an illustration of the cattle, but we are indebted to to Mr. Brydon, the popular steward of the marquis, for the following particulars. He says:

I am unable to give statistics as to the capabilities in the dairy of the Shetland cattle, but I know that when well fed they are good milkers and that the milk is rich. We use them chiefly for nursing calves, and we cannot get cows of any other breed on which they do so well. I can give lots of instances of this, but, at the moment, I remember one in particular. We had on the farm a little Shetland cow which calved about the 1st of June, and as she seemed to have a lot of milk we procured another calf and made her nurse the pair. Both calves were sold by auction when eleven months old, and the pair realized £43, the purchaser being a butcher. Of course the cow had cake and meal during the winter. The first cross from a Shetland by a Shorthorn bull also makes a very good cow.

The native home of the Shetland cattle is, as might be supposed, the Shetland Isles, which are situated between 59° 51′ and 60° 51′ north latitude, and 0° 41′ and 1° 50′ west longitude. The rocks are all primary, gneiss, granite, quartz, and stone slate being the prevailing formations, but in some parts there is a coarse variety of the old red sandstone and conglomeration. A great part of the surface is covered with peat, though there are generally green patches close to the sea. The hills are not high, only one in the whole group measuring 1,400 feet. The temperature is higher in winter and lower in summer than that of the Scottish mainland, the mean being stated as 45° 5′. Grass grows luxuriantly for a short time in summer, but in winter and spring, the islands present a bare, barren appearance.

The cattle have a hard life of it through, and as calves they scarcely get any milk, that being kept for other purposes. In spring they are so reduced with poverty that any one not acquainted with them could hardly suppose it possible they would come round, and yet a short time on coarse keep makes them look fresh and well. I have seen them thrive well on pasture where other and finer-bred cattle could not live. As may be expected, the treatment to which they are subjected stunts their growth, but if well fed when young they become very little less than other breeds.

(13) West Highlander Cattle.

As a milker, possibly the West Highlander cow has not much of a reputation, yet whatever milk she gives is exceedingly rich, and the men who are reared in a Highland glen, on good West Highland cream and some oatmeal bannocks, have little indeed to complain about. As to its beef, as is well known, it is the best to be found in the London market, and always commands as ready a sale as the best Shorthorns, Herefords, Galloways, or Polled. Though the West Highlanders thrive better on their native heath, they do very well in the South, and many of their admirers have displaced the deer from their parks and substituted the shaggy beast, thus revising to some extent the present process in the Highlands. They are thus ornamental as well as useful, and fetch better prices in the market than would the savory venison. As the points of the West Highlanders have never been laid down, it may be well to give here the opinions of all the noted breeders, together with some slight history of the most noted herds.

Characteristics of West Highland cattle.—The head should be beautifully proportioned to the rest of the animal; the fine head with a large tuft of hair on it; the nostrils full; the eyes large and liquid. There should be a proportionate breadth betwixt the jaw-bones behind to the large forehead in front. The horns should be lengthy, and showing what is called blood to the very point; they should come level out of the head, inclining forwards and upwards; in the cow they should rise up with a graceful slope. Some breeders do not care for the horns to rise upwards, being of opinion that the less rise there is the better. Perfection in a cow's horns is of two kinds, according to taste, but some prefer them to come out level from the head, with a peculiar back-set curve and a wider sweep. In the bull the horn should be decidedly strong, and what is termed sappy. Some are of opinion that when the horn droops suddenly from the crown to where the upward curve commences it is a sign of weak back. The cow's horns rise sooner from the head and are a little longer, preserving their substance and rich color to the very tips.

The neck should in length be proportionate, clean below, and in cows forming a straight line from the head to the shoulder. In point of thickness it should be fully developed, and the bulls should have a crest. The shoulder should be thick and immensely filled out downwards from the point to the lower extremity of the fore-arm.

The back, from the very back of the shoulder, should have a fully rounded development, what judges call "plain"; that is, a hollow behind the shoulder, as if you had tied a string about it, is exceedingly objectionable. Across the hips there should be great breadth, while from the hips backwards the quarters should have a very large development, being square betwixt the hips and the tail and betwixt the tail and the hind feet. As in the fore shoulders, the hind thighs should have an immense development. The tail should be thick and strong, with a full bunch of hair hanging down towards the ground. The bone, both in the fore and hind legs, should be thick, broad, and straight; the hoofs large and well set on, and the legs feathered with hair. There should be great breadth betwixt the fore legs, and the animals should walk with great dignity of motion; indeed, unless an animal possesses this dignified style of carriage, he will have small chances of winning prizes in the show-ring. The hair should be long, with a graceful wave in it—a curl in it is a decided fault—and should possess much bloom. The lack of wave in the hair is considered to be a great objection in many of the modern herds.

As a rule, the color is black, but fashion now runs on yellows or light duns and on brindles. A well-arranged herd should have a mixture of colors, avoiding all those which indicate unhealthy thrivers. A well-marked brindled bull is, however, all things being equal, a difficult one to beat at any northern show. A modern prejudice exists in some quarters against Highlanders being marked all over with white spots. They are not considered, however, to be of impure blood, and Mr. Stewart, of Tigh-Duin, one of the oldest and ablest authorities, is of opinion they were looked upon by all breeders as marks of purity or superiority. Possibly, too, he thinks that when the Ayrshires came into the Highlands the prejudice, which is a senseless one, arose. As regards the absence of the wave in the coat of modern show-yard representatives, it is held that it is to be accounted for by the growing desire to make Highlanders grow big, and from too kindly treatment. The more exposed the animal is the better does his hair grow. The whole points of the animal have to be considered, indeed, in the light that he has to make a living in a bare and storm-exposed locality; that, indeed, he has to thrive where a Polled Angus or an Ayrshire would starve. The question of thickness of skin, where fat, is one which is not left out of consideration; as in other animals, the sweetest beef being, as a rule, that under the thinnest skin. But a West Highlander with too thin a skin would not thrive well on the side of a wind-swept hill.

Though the West Highlander is not a good milker, she as a rule always gives enough and more to suckle her calf, which is allowed to run by her side till far on in the autumn, when it is weaned. Cows to calf are generally housed from the end of November to the middle of January, according to the weather and dates of calving. Young and yeald cattle, possibly, do better when wintered out with open sheds for shelter erected in the fields. Thousands, indeed, in some localities are never housed at all, unless snow is deep, and even then they thrive tolerably well if a little hay is given them, and they have some little shelter from a bit of woodland or the projecting side of some hill. When first put in in May they are fed upon straw or the coarsest of the meadow hay; after calving, upon meadow hay supplemented with turnips. When in finest bloom the West Highlander is indeed a perfect picture; and that is generally in the three last months of the year. His coat of hair is then at its best, and he looks every inch a monarch, prepared to fight and wrestle with the north wind.

Possibly on the richer pastures of the Lowlands he would not look so well. Still at all times he looks by far the most noble of the bovine race. For parks he therefore is in good demand, and it is possible that he may find a home in every demesne where his picturesque appearance becomes well the woodland scenery. No doubt in many places of the Highlands he has been supplanted by the Ayrshire, Shorthorn, and the Polled, but where herbage is thin and scant and there has to be some mountaineering to get it, Donald Buidhe and Duncan Ruadh will hold their own. It was thought by many that the West Highlander would have well suited the ranches of America, but what is wanted there is not animals to increase the weather-defying qualities, so to speak, but to promote the tendency to make beef, the Texan stock possessing many of the powers of endurance for which the West Highlander is noted.

Noted herds of West Highland cattle.—Of the most noted herds which at present are kept very pure in the Highlands may be mentioned that of Rossie belonging to Lord Kinnaird. This herd was formed four years ago on the dispersion of the famous Urlar herd, on the 16th May, 1878, by the purchase of some of the best of that old blood. A much older herd is that of Poltalloch, which was formed as far back as 1795, from stock purchased at Castle Craignish and in the island of Shuna. The annual sale of the Poltalloch draft affords opportunities to breeders who may wish to establish similar herds.

At Benmore there is also a famous herd which was formed in the years 1873 and 1876, by selection from the then famous herd of Mr. John Stewart, Bochastle, Callender, including the celebrated bull Donachadh Ban Nan Oran and the cow Phrisiag 2nd. The former won the first prize at the Highland Society's Show at Edinburgh in 1877, and also first prize at the great show in Paris. The cow mentioned also won first honors wherever exhibited, and her victories include a first prize at Paris. While at the latter exhibition the famous bull was admired by Rosa Bonheur, who subsequently painted his portrait for Mr. Duncan.

The Breadalbane herd which was dispersed in 1862, on the death of the late marquis, was reformed under the late earl in 1871, with purchase of some stock at the Urlar sale mentioned, Urlar being indeed close to Taymouth Castle. Some of the old Breadalbane cows were also secured by Mr. Dunn, his lordship's manager at Kenmore Mains, also the second prize Higland and agricultural bull Ossian, bred by the Duke of Athole. Since then the herd has been increased by several selections from the Bochastle and Poltalloch herds, the present earl taking an interest in it.

Amongst other noted herds are those of the Duke of Athole, Lord Dunmore, Mr. Stewart, Duntulm. Mr. Stewart, of Tigh Duin, Killin, is one of an enthusiastic family of breeders who have stuck to the West Highlander for several generations. Indeed the history of the West Highlander is interwoven with that of the family.

That the West Highlander has a future before it many good judges think. Its beef is the richest in the market, and in these days of quantity, quality is certainly worthy of consideration. A herd book is being got up for them by Lord Dunmore, and, though its Gaelic may be almost untranslatable, in the long run it will spread its popularity. The West Highlander, grand as he is, does not yet suit the views of the butcher, and Mr. Dykes admits that although this is the case he is being brought back to his ancient self among Scottish cattle nobility, and is yearly the wonder of the Londoner at the annual Smithfield exhibitions.

Mr. Drummond Moray, of Blair Drummond, Stirling, a famous exhibiter of the race, says:

> Highland cattle are not bred here, but are bought in at from eighteen to thirty months old for the purpose of being fattened. Heifers at the age of three and a half years will, with ordinary feeding and 4 pounds of cake per day for the last three months, feed up to 5 or 5½ cwt. That is the weight of the carcass of beef after being slaughtered and dressed. Oxen of the same age and fed in the same way, with a little additional cake during the last three or four months, will feed up to fully 7 cwt. of beef. These weights can be attained at an earlier period by giving better food and commencing the cake earlier, or the weights may be very much increased by keeping on the animals for another year, but as a rule it pays best to fatten Highland cattle off the grass when they are about three and a half years old. Many excellent animals of this breed have been fed here for show purposes, the weight of which when slaughtered came up to 12 or 13 cwt. of beef, but these were generally four and a half years old or a month or two more. The proportion of beef to the live weight of a good, well-fattened Highland ox is nearly two-thirds of the weight. The animals are hardy, and after the first winter (when they should be housed) they thrive in any sheltered situation, but when they get into good condition they should be put into courts to prevent the loss of flesh in cold weather. None of this breed are used for draft purposes in this district, and I never saw them so used anywhere.

Mr. James Duncan, whose herd at Benmore has been already referred to, gives us some further information. He says:

My Highland cattle are kept by me simply for breeding purposes. I do not separate the calves from the cows. Although I cannot tell how much milk my cows give, yet the quality of it and of that from the Highland cattle in general is very fine. Highland cattle are never under cover; they are very hardy and will live where other animals would starve. I have a considerable number on the hills in Scotland. The grasses are native, and in winter the cattle eat heather furze and other bushes. The master of Blantyre has succeeded in working Highland cattle; and it is a well known fact that they produce the finest beef. When in America in 1876 I advised some of the western farmers to give them a trial, as in many districts they would do far better than the Shorthorn; for instance, on the Rocky Mountains and in some of the plains they would do very well, but where there is an abundance of fine grass it would be a mistake, in my opinion, to introduce them. I may mention that there is only one question about the adaptability of Highland cattle for America, and that is the extreme heat of summer.

Sir John Swinburne, an eminent owner of this breed, says, in answer to a communication from us:

I do not breed the Highland cattle, but buy them at about twenty-four to thirty months old, at Falkirk Trysts, which are held annually in September and October. Their native homes are not cold, but constantly wet from rain and mist, and there is not much snow. Their long hair enables them to remain out all winter, and they will thrive, but do not grow fat, on very rough pastures, and bear whatever cold there is remarkably well. The age at maturity of the West Highlander is about four years, and the live weight of the cow at maturity is about 76 stone, and that of the bulls about 97 stone. The proportion of meat at maturity of a fattened steer is about two-thirds of its live weight. I have never heard of the West Highlander being used for draft purposes. They are housed in open boxes and fed and handled in the same manner as other cattle.

The Earl of Seafield is one of the large breeders of this race, and we consequently put a series of questions to his steward, who has kindly given us the following particulars in reply:

With regard to the annual average pounds of milk per cow, I find the quantity to be 3,780 pounds.

A cow which matures in four years is 11 cwt. in weight, and 6½ feet in girth, whilst a bull arrives at maturity in five years, weighs 14 cwt., and has a girth of 7 feet. Oxen are five years old when at maturity, weigh 16 cwt., and possess a girth of 7½ feet. The soil on which the cattle are fed is light and gravelly, and the mean temperature of the district in summer is 60°, and in winter, 40°. The grasses cultivated by his lordship are perennial rye-grass, alsyke, and red and white clovers. The Highland cattle are not used for the purposes of draft. As to the housing of them, they, in winter, have open courts and byres, and the feeding is principally permanent pasture, and in winter straw and turnips. Breeding begins when the animals are from two to three years old; and as to handling, they are generally housed in winter in our part of the country, but in the West Highlands they seldom are housed, but in stormy weather they are fed on meadow hay.

Mr. R. B. Saunders, of Guisbro, Yorkshire, who resided among the West Highland breed of cattle on the west coast of Scotland before going to act as the agent of Sir Joseph Pease, M. P., says:

This breed is managed under a variety of systems, some only keeping cows for breeding purposes, others buying the young cattle and keeping them from one to two years before selling them to the owners of parks and good pastures, when they are fattened. This applies to both heifers and bullocks. In a few cases the heifers are crossed with a Shorthorn bull, and after rearing a good calf, are fattened. The West Highland being devoted to meat production, and rarely used for dairy purposes, it is, perhaps, impossible to obtain in the British Islands any reliable record giving the annual average yield of milk per cow or the quantity required for the manufacture of a given quantity of butter or cheese. The size of the animals varies according to the shelter and food given when young.

The cows mature at five years old, and weigh 50 stone, of 14 pounds each, dead weight. Bulls are at maturity at four years and oxen at the same period, the former weighing 70 stone, of 14 pounds, and the latter, 60, dead weight. The steers equal the Shorthorns in the proportion of meat on arriving at maturity. The nature of the soil in the valleys is deep loamy, that on the higher grounds a thin covering of dry friable soil, partly lying on whin-stone (trap-rock,) and the Western Islands on granite. The mean temperature in summer is 60°, and 45° in winter. The animals are never used for the purposes of draft. The in-calf cows have generally the best sheltered ground, with an open shed, but in some cases are tied up in houses. Through the winter the calves have the same housing. The food consists of bog or meadow hay, twice a day after the 1st of January. The young store cattle are not housed after they reach one year old, and in many cases only get hay or straw when the rough grasses in the woods and valleys are covered with snow. On some farms where straw and turnips are grown the cows and calves are partly fed on these. In a great many instances all the three-year old cattle leave their native grounds for gentlemen's parks, when they are given hay and cake once a day through winter. The cows are usually disposed of from eight to ten years of age to the butcher. In the best herds the heifers are not served by the bull until three years of age.

Mr. Robert Stewart, of Stirling, says he never breeds the West Highlander for dairy purposes, and that although they give no great quantity of milk, yet it is rich in quality. His calves suck the cows, and follow them at foot in summer. The breed at about five years is at maturity, and 7 cwt. is, he considers, a fair average live weight for a well-bred cow, 10 cwt. for a well-conditional bull, while a well-bred and well-fed ox at that age should average 16 cwt. The proportion of meat at maturity of a fattened steer is about 10 cwt. Here, where the cattle are mostly bred and not fed, their food consists only of rough natural grass in summer and meadow hay in winter. None of the animals are used for draft purposes of which Mr. Stewart is aware, and as to housing, he states that the cows are in winter housed, and also that the calves are put in in winter till a year old; but the bulls and two-year olds winter quite as well outside. The feeding is generally meadow hay. The animals, except those for breeding are generally sold when two years old.

(14) GALLOWAY CATTLE.

The secretary of the Galloway Cattle Society (the Rev. Mr. Gillespie, of Mouswald), says the Polled Angus is a magnificent breed for particular circumstances; but there is not a breed possessing so many recommendations to American breeders as the Galloways. There is no breed of Polled cattle in Britain so impressive and influential as the Galloways in crossing with horned cattle, with the view of getting quit of the horns. He affirms that where a pure well-bred Galloway bull is put to cows of any horned breed the produce in ninety-nine cases out of every one hundred will be polled, and he leaves those in a position to judge to say whether there is any other Polled breed of which the same can be said. Then there is their hardy character, which is a great point in their favor. There is no breed he states, except perhaps the West Highlands, so peculiarly fitted for exposure to extremes of heat and cold experienced in many parts of the Western States, where a large number of cattle have to lay out at all seasons. The breed is also a capital beef-producing one, and he is sorry to observe that in recent years breeders have been doing so little towards bringing this quality before the notice of the public.

As an instance of what may be done he refers to the way in which Mr. McCombie has taken the Polled Angus breed into the world and made a name for it. That gentleman has shown the public the merits of the breed, and the result is well known. The Aberdeen farmers have great reason to bless the name of the late Mr. McCombie in all time coming, says Mr. Gillespie, and he thinks the breeders of Galloways have been too backward in showing the world the superiority of their animals for beef-producing purposes. Outsiders, however, are beginning to see that the breed possesses great merits, hence its growing popularity. In 1861 Mr. McCombie won both at Smithfield and Birmingham with Galloway animals bred by the Duke of Buccleuch; and in 1872 Mr. James Cunningham won a prize with a heifer bred by Mr. Biggar, of Chapelton, which had previously taken first prizes in the Highland Society's Shows, and afterwards won the champion prize in the Polled class at Smithfield. Mr. Gillespie thinks the Galloway breeders are greatly indebted to Mr. Jardine, of Castlemik, for what he has done in recent years towards bringing the breed to the front, and that the cattle had a better name in the world ten or twenty years ago than it at present has simply because more was done then than now to display their merit. If, adds Mr. Gillespie, the breeders all over the country had taken pains to maintain the prestige of the stock they would now have been in a much more favorable position, and if now they do their duty to their cattle the money value of the animals will rapidly rise.

The Galloway is not a special milking race, and is little used for either butter or cheese making, nor is it used for draft, although a few isolated farmers may be seen with it at the plow. They are an old breed, and were highly valued as long as fifty years ago, when small horns were sometimes seen. Then their average weight was 60 to 70 stone, but it is now much increased. The hide is thin and the meat is wonderfully well marbled, and found in the best parts in abundance. They are bred in Scotland almost entirely, but large numbers are brought into England and sold at the fairs to farmers for fattening. The milk, tolerable in quantity for a grazing beast, is decidedly rich, but it is largely the custom to spay heifers, and at one time the practice was still more general. The calves are very often allowed to run with the dam, but to have only one-half her milk, the other half going into the house. This is managed by the dairymaid milking two teats twice a day and affixing a spiked muzzle to the calf. The Galloways are grand beasts, and their native home is the wet mountainous district of the southwest of Scotland, and although considered by some people to be similar in character to the Polled Angus, they are much hardier and more vigorous as a race. There is no question that they are not such early maturing beasts as the Angus, the Hereford, or the Shorthorn, although, in truth, they have hitherto received no such help from the breeder as has been bestowed upon those famous races. The Galloway is thicker in its hide than the Angus, and when it is remembered that to withstand exposure and extreme cold this is necessary, it will be understood that for mellowness, and consequently meat production, it would be hardly fair to claim the same quality for the one as for the other. For these cold bleak districts, more especially if they are also wet, the Galloway will at all times beat his more polished rival.

The Galloway Poll is not such a very bad feeder. Half a dozen cattle were recently sold by live weight to a Liverpool butcher at 9*d.* per pound of carcass weight, which was assumed to be 53 per cent. of their live weight, ascertained on a weighing-machine immediately before the meal hour. The lot consisted of three two-year old bullocks and an equal number of Shorthorn-Ayrshire crosses of the same age. Four of these animals had been bred on the farm, and the remaining two had been summered and wintered on it. They had been fed in the same manner as the previous lot, and the balance of percentage in the butcher's favor was even higher than in the first lot. From the following figures it will be seen that the Galloways killed decidedly better than the Shorthorn-Ayrshire crosses. The former showed a higher carcass weight than was estimated, while in the case of the crosses a contrary return was made. The following are the details:

Description of animal.	Live weight.		Estimated carcass weight.	Actual carcass weight.
	Stone,	*pounds.*	*Pounds.*	*Pounds.*
Galloway bullock	72	6	537	602
Do	71	7	530	560
Galloway heifer	75	2	557	590
Cross bullock	74	0	549	506
Do	59	10	443	408
Do	60	0	445	492
			3,061	3,158

SECOND REPORT ON THE GALLOWAY CATTLE.*

The Galloway breeders of England and Scotland are justifiably jealous of the efforts which have been made from time to time by rival breeders to depreciate their breeds, or to insinuate that their origin is of recent date. There can be no doubt, however, that the Galloway is one of the oldest of our pure races, and that it has been bred for many generations to a particular type, while it is believed to be beyond doubt that they have contributed in a marked degree to the formation and improvement of some of the other leading British breeds. At all events it is known that they have entered largely in times gone by into the east of England breeds, more especially in those districts which are now famous for the Red Polls.

During the last century the Galloway was perhaps better known than any other breed, for it has been very frequently described by agricultural writers of that period as a symmetrical beast of high quality and considerable beauty, and one which was adapted for early maturity and rapidity in fattening as well as, or perhaps better, than any other breed that was then known. This quality they have maintained to the present day, and it is the more remarkable, inasmuch as the pastures upon which they graze are much inferior to those in other parts of the country where equally famous breeds are bred and fed. At the present time they maintain their position for rapid growth and good feeding, and they have for a long period held a leading place in the London meat markets, where they are not infrequently found at a very early age, the grain of the flesh being extremely delicate and rich in flavor as well as finely marbled with fat. Whether or not the breed has at any time been crossed with the horned races of England it is difficult to say, and the information is somewhat conflicting, the Galloway breeders entirely disbelieving it, and quoting the apparently absurd results which would have been obtained by the use of horned bulls, although it is forgotten that in crossing horned beasts with either the Galloway or the Aberdeen it is a fact that almost every animal produced comes without horns. That Galloway breeders have been most skilful in their work as well as in their feeding and management there is no doubt, but we should not like to assert in any dictatorial manner that they, like other breeders, have not now and then found it beneficial (we speak of the past) to have recourse to other breeds for improvement.

---

* In forwarding this second report on Galloway cattle, under date of March 15, 1884, Consul Shaw says: I herewith forward with pleasure a supplemental report on the Galloway breed of cattle for insertion in the able and full report which I had the honor to transmit on the 19th of February. Mr. James Long, who has prepared the same, thinks this additional data specially useful.

There appears to be a tradition that at one time the race was horned, but it is certain, however, that those who have pretended to keep it pure have at all times abolished every trace of horn, and declined to use animals for stock which had this apparent blemish, and one which was considered a certain sign of impurity. It is believed at the present day that there is far less sign of horn even in the most incipient stage in the Galloway race than there is in either the Red Poll or the Angus.

It has been stated repeatedly that the Galloway is a more vigorous, lusty, and hardy beast than any other variety, inclusive of the Welsh and the West Highland; that it exceeds the Welsh in these respects there can be no doubt, but we do not think it is quite so hardy as the West Highland, the coat of which enables it to brave the weather at all seasons of the year better than any of our native breeds. Again, the breed has often been charged with coarseness on account of the thickness of its skin; but it must be remembered that the breeders, while endeavoring to improve the quality of flesh by every means in their power, have studiously retained a certain thickness of skin which they have justly considered to be consistent with their hardiness, so that in reality it is one of the principles of the breeders of the Galloways to combine, as far as possible, quality of flesh with a tolerable thickness of skin, and it is somewhat remarkable that in this they have succeeded; for, excepting in the thinnest skinned beast which is much less hardy, there is no animal more mellow to the touch or full of quality. They also endeavor to retain, as far as it is possible for them to do so, a thick coat with rather long hair, for, although they do not inhabit a district so wild or so high and bleak as the West Highland breed, that portion of the south of Scotland and north of England is by no means well protected from the weather and the winds even in valleys. In some parts they are placed on the hills, which, as is well known, are bleak and exposed in the extreme, and there they appear to thrive uncommonly well, and to occupy ground from which it is not likely they will be displaced by any other native breed, unless the West Highland should be introduced, which is most unlikely.

It has often been remarked by foreign buyers visiting the Galloway district that they could not have believed it possible to maintain, in such great perfection, many of the herds of high-bred Galloways which they have seen, in these cold and elevated regions (sometimes 1,500 feet above the sea), where nothing is found but the famous mountain sheep of the country, and decidedly miserable fare, for the crops cultivated are necessarily few and poor. Again, notwithstanding the fact that the winters are most severe, it is frequently the case that the Galloway is entirely kept out of doors; occasionally an open shed is erected for them to shelter themselves when they choose, but as a general rule they have to rely for protection upon that which nature affords, sometimes being assisted with a little hay, which is usually carried to them when snow is upon the ground or when the frost is severe. It is stated by Mr. Gillespie that this system is pursued, not because of the expense or trouble, but because the farmers believe that they are able to stand the winter with ease and to grow much better during the following summer than if wintered under cover.

Young beasts of from 1½ to 2 years old are often sold in the markets at £25 to £30 each, never having been sheltered since they were weaned. This vigor is not solely the characteristic of the adult beast, for when a cow calves in the open, in severe weather, the calf itself does not appear to lose activity or to feel the severity of the weather as might be expected, but is as happy and contented, when thoroughly dry, as if in a warm stable upon plenty of straw. The hardy constitution of the breed enables it (and this is somewhat strange) to withstand the fatigue of long journeys to market towns as well as it withstands the cold of winter; and when it is found necessary to drive any of the beasts to fairs, at distances of from 100 to 200 miles, they usually arrive in a much fresher condition than any other animal known to the cattle dealer.

It is stated above that Galloway beef is favored in the London market by the butchers; indeed it may not be known that it is classed as prime Scot, a term so well known to readers of the London newspapers, where the price of meat is quoted. It has repeatedly been proved, not only by the meat salesmen themselves, but by breeders and feeders, that no beast obtains a higher price, not even the Aberdeen, and certainly not the Shorthorn or the Hereford. In fact it is very seldom that meat of any kind, at the Christmas market especially, reaches the quality of the best Galloway. Testimonies without number could easily be obtained, and several have been obtained by the Galloway society and published in their description of the breed, in which butchers in various parts of the country have testified to the quality and value of the meat. The Galloways are generally considered to dress to the extent of 60 per cent. of their live weight, and occasionally an animal is found to exceed this, which, it will be admitted, is exceptionally good. This depends chiefly upon the system of the feeder and on the management of the animals.

The following quotation from the description of the Galloway by the editor of the Herd-book, will be of some value in arriving at a knowledge upon this point:

AGRICULTURAL LIBRARY, UNIVERSITY —OF— CALIFORNIA

Age.	Live weight.	Dead weight.
	Pounds.	*Pounds.*
One year three months	900	540
Two years three months	1,400	840
Three years three months	1,750	1,070
Four years	2,000	1,240

While these may be regarded as an average, far heavier weights have been reached whenever an effort has been made to force forward individual animals. It appears from the catalogues of the Smithfield Fat Stock Show that in 1883 a pure-bred Galloway steer, at two years ten months three weeks old, weighed 19 cwts. 20 pounds, viz, 2,148 pounds weight when 1,055 days old, which makes an average of 2 pounds daily incrense in live weight.

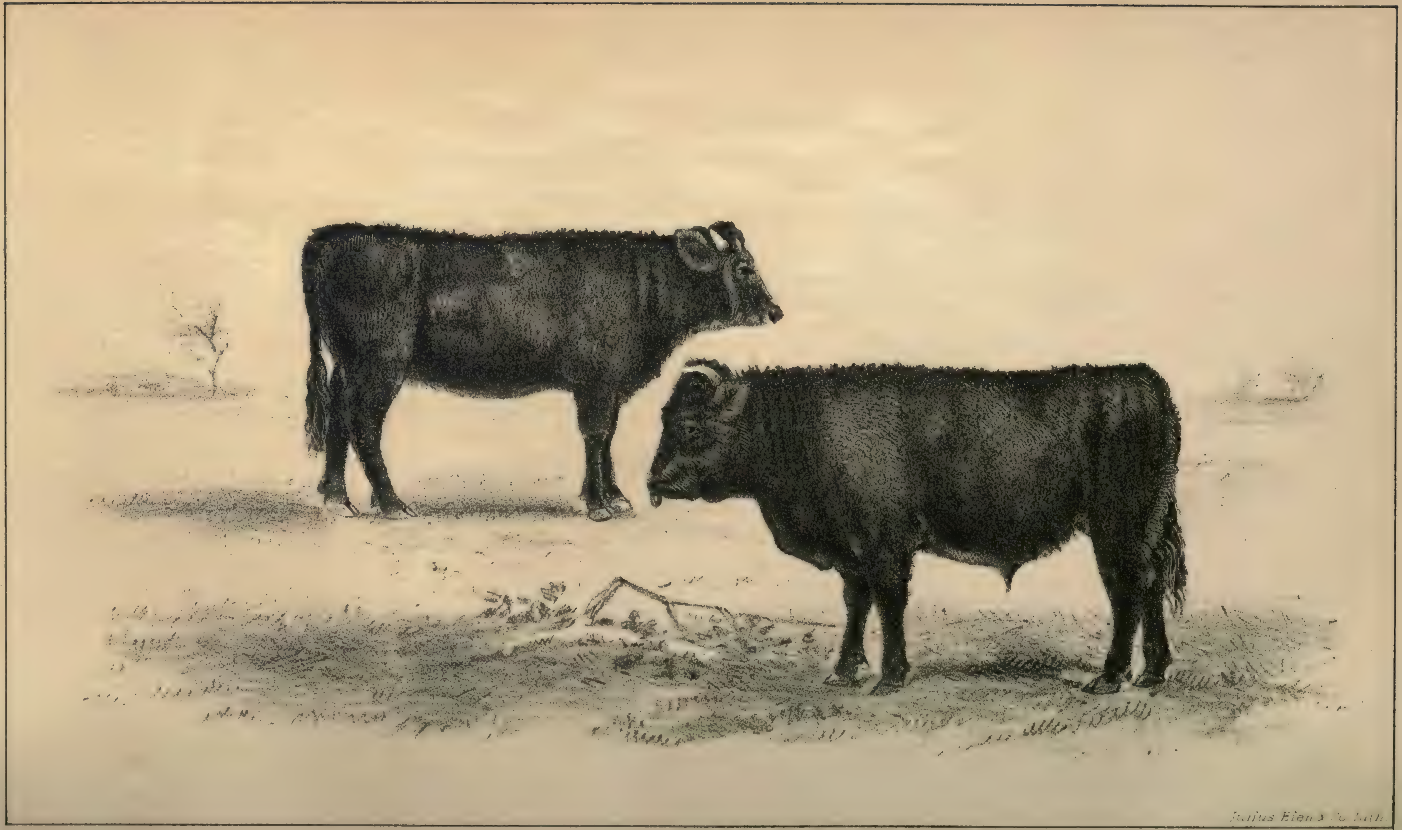
In 1882 a pedigree Galloway steer, two years nine months one week old, weighed 17 cwt. 18 pounds, viz, 1,922 pounds weight when 1,004 days old, which shows an average of 1.91 pounds per day of increase. Another pedigree Galloway at the same show turned the scales at 15 cwt. 2 quarters 18 pounds, when two years eight months three weeks old, viz, 1,754 pounds weight when 973 days old, which is equivalent to 1.8 pounds of daily increase. It seems remarkable that at the principal cattle shows in England the Galloway is seldom seen, and this is more particularly the case at the Christmas fat-stock exhibitions. The demand being considerable, and as the breeders live at a great distance and do not care for the system of forcing cattle for exhibition, they prefer to leave the glories of the prize ring to the other Scotch breeds, such as the Angus and the West Highland.

This, perhaps, in a measure (although it would be impossible to detract from the value of the breed), has without doubt contributed to the popularity of the other breeds and to the want of knowledge with regard to the Galloway itself.

As this breed is so essentially a meat-making one, it will hardly be supposed that as a milker it has any especial value, but, like the Devon, although it does not give a large quantity, it gives milk of a marvellous quality. Some strains, however, give very much more than others, while there are those which make a most respectable quantity of butter in proportion to the milk they give. Speaking of it generally, it is a non-milking breed; hence we have found it entirely impossible to obtain any authentic records either of milk, butter, or cheese production, although there are numerous cases in which owners have estimated the yields of particular cows at from 9 to 12 pounds per week in the middle of the summer season. We believe, however, that just as the Red Poll of Suffolk and Norfolk has been by judicious selection converted into a milk-producing breed, so by great care in selection and breeding the Galloway could be made, certainly not the best of milking breeds, but one of considerable value, such as would prove most profitable to those who kept it for the purpose of making either butter or cheese.

That the marvelous prepotency of the Galloway breed is an evidence of its purity and ancient character we firmly believe, and, as we remarked above, just as when mated with horned cows it produces the calf without horns, so does the color of the progeny remain, being either an entire black or a black which is slightly mingled with white or shaded with blue. This fact leads us to make the suggestion that it would be possible to cross the Galloway upon, for instance, Shorthorn cows of superior milking quality and yet maintain the chief characteristics of the breed, and as it is admitted, even by the breeders themselves, that it is often difficult to tell a beast which is only half bred from one of pure breed, so is it apparent that many of the objections which have been made to Galloways as feeders have arisen from the fact that the observation has not been made from the pure breed, but from the cross-bred itself.

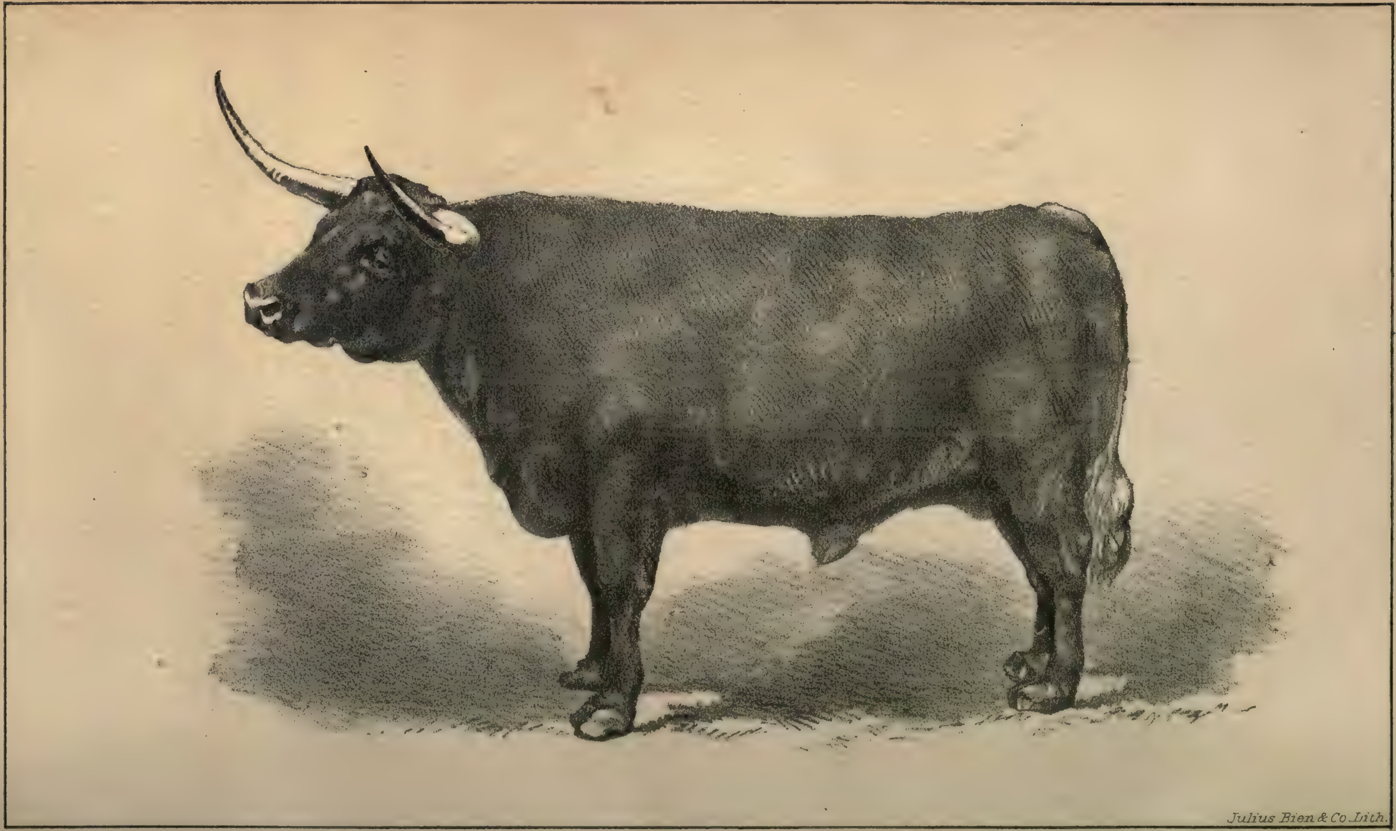
The Duke of Buccleuch put his famous Galloway bull Black Prince of Drumlanrig (546), to two long-horned West Highland cows, carefully selected from one of the oldest and best herds of that noble breed. When the produce of this cross, two heifers, were grazing at the age of about eighteen months among a lot of nearly a score of pure-bred pedigree Galloway heifers, half a dozen of the most experienced and best-known breeders of Galloways were asked by the duke's manager to point out the half Galloways among the pure ones, and each one of these experienced judges picked out the wrong animals, so closely did the one in every particular resemble the other. Galloway bulls have been very extensively put to both Shorthorn and Ayrshire cows, and in England especially it has been a favorite and highly successful mode of crossing for beef purposes to use the Shorthorn bull on the Galloway cow. By either mode symmetrical cattle of very large frames have been produced; they have proved to be hardy, and their meat is free from patchiness, well mixed, and altogether superior. Galloway crosses, when liberally reared and fed, mature early and reach very heavy weights. At the Smithfield fat stock show in 1882 a cross steer, by a Shorthorn bull out of a Polled Galloway cow, weighed 1,480 pounds when one


Julius Bien & Co. Lith.

A WELSH YEARLING BULL AND HEIFER

THE PROPERTY OF MR G F BOWDEN

PLATE 20



Julius Bien & Co. Lith.

MAJ. PLATT'S WELSH OX

FIRST IN HIS CLASS AT THE AGRICULTURAL HALL year and eight months old, showing the high average of 2.43 pounds per day of its life. At the same show a Galloway cross, similarly bred, weighed 19 cwt. 3 qrs. 20 lbs. when three years four months old, that is, 2,232 pounds when its age was twelve hundred and seventeen days, which is equivalent to an average of 1.83 pounds daily since it was calved. At Smithfield, in 1383, the only Galloway cross steer exhibited turned the scales at 1,816 pounds when ten hundred and eighteen days old, making an average of 1.78 pounds of daily increase.

Characteristics.—The council of the Galloway Cattle Society of Great Britain have drawn up a standard showing the characteristics of the Galloway breed, which are as follows:

Color: Black, with a brownish tinge. *Head:* Short and wide, with broad forehead and wide nostrils, without the slightest symptoms of horns or scurs; eye, large and prominent; ear, moderate in length and broad, pointing forwards and upwards, with fringe of long hairs. *Neck:* Moderate in length, clean and filling well into the shoulders, the top in a line with the back in a female, and in a male naturally rising with age. *Body:* Deep, rounded, and symmetrical; shoulders, fine and straight, moderately wide above (coarse shoulder points and sharp or high shoulders are objectionable); breast, full and deep; back and rump, straight; ribs, deep and well sprung; loin and sirloin, well filled; hookbones, not prominent; hindquarters, long, moderately wide, and well filled; flank, deep and full. *Thighs:* Broad, straight, and well let down to hock (rounded buttocks are very objectionable); legs, short and clean, with fine bone; tail, well set on and moderately thick. *Skin:* Mellow and moderately thick; hair, soft and wavy, with mossy undercoat (wiry or curly hair is very objectionable).

(15) WELSH CATTLE.

Mr. Harvey, editor of the Herd-Book, says:

The Black Welsh cattle are natives of the counties of Pembroke, Carmarthen, and Cardigan, and are more generally known as Pembrokeshire Blacks, subdivided into Castlemartin and Dewsland breeds. From Cardiganshire they also extend along the North Wales coast up to Anglesea, and are then called the North Wales or Anglesea breeds. Whether they were ever indigenous to Radnorshire or Breconshire I am not aware, but as I have an intimate knowledge of both these counties, I can say from long personal observation that they are not now to be found in either of them. In Glamorganshire they are to be found in the seigniory of Gower; but in the eastern part of the county there is a native breed, which is, however, becoming rapidly supplanted by Shorthorns and Herefords.

The breed of Black cattle is generally supposed to be descended from the *Bos primigenius*, and is allied to the wild cattle in Chillingham Park, and also to the Devons. They may be described as a horned breed, generally of black color, and frequently with white marks on the udders of the cows, also a few white hairs at the end of the tail. Sometimes a few white hairs are mixed up with the coat, but this is not always hereditary, and only comes out occasionally. A brown-black, approaching a chocolate, is considered a good color. Occasionally there are some cows striped red and black; also some quite white, with black ears, muzzle, and feet, but these are becoming very rare. The horns should be of a rich yellow; they are generally tipped with black, and do not come out yellow to the very end like Herefords. There is a different pitch of horn for bulls and cows. A bull's horns should be low and well spread; the cow's narrower and the pitch more upright. The steers and oxen take more after the bulls. This description applies in a great measure to the Anglesey cattle. These are, however, broader on the back and shorter in the leg, with more hair. The heads are heavier and the horns not so yellow as the Pembrokeshire. A really good animal of the Black breed should approach very closely in shape to the modern fashionable breeds, and by careful and judicious crossing this has sometimes been attained.

The natural characteristics of the breed may, however, be described as narrow on the shoulder and chine, slack on the loins, an inclination to be high on the rump, and flat-sided. They are generally deep in front and light behind. It must not, however, be supposed that every bullock has all these defects, but some of them are to be found in the generality of the cattle offered at the country fairs. Other breeds of cattle with these natural defects may also be found, but care and attention have modified them very much, and the object of the Herd-Book is to create such an interest in the Blacks as may render badly shaped cattle as "few and far between" as they are in the Hereford and Shorthorn districts.

The special characteristics of the Blacks, which make them so valuable, are: Hardidood of constitution, aptitude for dairy purposes, and docility.

As regards hardiness of constitution, no one acquainted with the common method of rearing the calves and their subsequent treatment and the hardships they undergo can have any doubt on that point. The great wonder is that respectable-looking cattle can be shown after having been reared in such a manner. During the time when the rinderpest caused such havoc, that fell disease was not known in South Wales, principally from the great exertions made by the county magistrates and other authorities to prevent the transit of infected animals, but also because the constitutions of the cattle were so good that even on the frontier of infected districts they repelled the disease. When the Blacks were taken into counties where the rinderpest was prevalent they seldom, if ever, caught the infection. The same immunity also existed when the foot-and-mouth disease was so general. There were certainly some cases supposed to have been caused by the importation of Irish cattle, but upon inquiry it will be found that those herds of cows which consisted of Shorthorns, Ayrshire, and Guernsey were those that suffered.

As to aptitude for dairy purposes, I do not trust merely to the report of others, but, having for some years had a dairy of from 18 to 20 cows, I can speak personally of the qualifications of this breed in that respect. Some of these 20 were in every year heifers which had their first calf, and were not so profitable as older animals. My account book shows the churning as under:

	Pounds.
From September 29,1862, to September 29, 1863	2,896
From September 29, 1863, to September 29, 1864	2,725
From September 29, 1864, to September 29, 1865	2,755
From September 29, 1865, to September 29, 1866	2,450
From September 29, 1866, to September 29, 1867	2,815

The yield of butter was affected by the dry weather in some seasons, as my farm was not well watered. As regards the reduction in quantity after 1863, I reared more calves every year afterward, and as the bull calves were nearly all sold for stock purposes they had to be kept well. I also had on an average about 25 cwt. of skim cheese sold every year, and small pigs were fed on the whey and buttermilk, and turned out to grass and sold as "stores," realizing from £23 to £36 per annum profit between buying and selling. My farm was only about 70 acres, and it will thus be seen that there was a large return for the area. I have also heard of places where only 1 or 2 Black cows were kept where the yield of butter was very great, amounting to 14 pounds per cow per week. I have never in my own dairy churned more than 10 to 11 pounds from a fresh-calved cow; but where 20 cows are grazing on a small area there is no chance of very great individual results.

The docility of the breed is remarkable. A stranger may go safely into a herd of cows, but it is not safe to do so where there is a bull, unless accompanied by some person acquainted with its habits. I have a very strong feeling that bulls after they are one year old should be always kept in the house, not only avoiding accidents, but enabling the farmer to regulate the times of calving. The cows stand very quietly to be milked in the yard or in the house, and with their large, full eyes and quiet expression look the very picture of docility. There is no doubt but that the Black breed as now reared are not apt to fatten at an early age, but I have seen instances where, when reared like the improved breeds, they have done so. Still I do not wish to assert that at present they are so profitable for stall-feeding, but I maintain that, looking at the soil, the climate, and the accommodation for them during the winter, they are the only breed that will pay the farmer's rent. Those who have seen a good Black ox well fed have always acknowledged that there cannot be a handsomer animal. Butchers will tell you that the quality of the meat is not to be surpassed, and that the internal fat is much in excess of Shorthorns and Herefords of a similar size.

The usual method of rearing calves is to take the calf away from the cow after a few days, and then give it nothing but skim-milk. When it is able to eat it is given hay and barley or oatmeal, upon which it thrives fairly. But in the month of May or June the poor animal which has never seen grass, and does not know what it is, is turned out into a good pasture, and there, before its tender mouth can properly eat, it loses all its calf flesh, and when the winter comes on it is still lean. My own method was to take away the calf after a few days and give it its own mother's milk for one month, then half new and half skim for a fortnight, and afterwards skim-milk only with a little dissolved oil-cake mixed with it. Sweet hay and mangels were given as soon as it was proper, and in the spring *cut grass* was gradually introduced, so that the calf, when turned out in June, readily took to it. A little milk and water, with crushed oats and some oil-cake, given all the summer. The first winter, turnips, hay, oil-cake, and oats, and then turned out to grass at one year old, strong, useful yearlings with good constitutions. Afterwards they had no corn or oil cake, but the next winter fed on straw and turnips.

Mr. Griffith Lewis says:

I give my calves a month's new milk; in fact, let them suck the cow. I then wean them, and give them, for two months, skim milk-scalded, and as soon as they will eat it a little hay and oats. I then turn the mout in to grass about the first week in June, and leave them out till the first week in October, when I bring them in at night into an open shed and give them hay and mangels or swedes. I never rear a calf after the 1st of April, as I find the milk becomes too rich and scours them, and also they are not strong enough to be turned out the first week in June. You can make any use of this you like.

Mr. John Richards says:

The way I rear my calves is: I leave them three weeks on the cow; after that they have milk twice a day, and oats, oil-cake, hay, and roots till they are four months old; then they are turned out on grass, but if they are Christmas calves they are kept in till June.

Mr. Richard Thomas says:

Have been busy at the hay yesterday and the day before, or I would have answered your letter sooner. My system of rearing calves is to give them new milk for three weeks, then I give them skim-milk for about three months, with hay, mangels, and crushed oats. The calves I rear from November to March are turned out to grass, the oldest ones in May and the others in June. About the middle of August I give them a drench for the murrain. In October I commence giving them some crushed oats daily. I keep this lot out all the winter in a dry, sheltered field, and in November I begin giving them hay twice a day. The calves that are calved after March I keep in till the following spring, in a yard and an open shed. They have the same quantity of new milk, and about two months skim-milk, and give them hay, mangels, vetches, and oats. In winter they have swedes, hay, and straw. I give them a drench the same time as the others, and have not lost one calf from the murrain this twelve years. I shall be most happy to give you any further information should you require it.

The Black cattle, which were more conspicuously placed before the public in 1874, when the first Herd-Book was published, have improved very much by the exertions of the farmers and by the noblemen who are interested in the result. The breed is now recognized by the Royal Agricultural Society in its exhibition of stock, and will soon attain the perfection of form and weight of the most improved breeds. This arises in a measure from the greater care taken with the stock whilst quite young, to which attention was drawn in the first Herd-Book.

The question of *early maturity* has been solved satisfactorily where the Blacks have the same treatment as the Shorthorn and Herefords, and Mr. Harvey says he has seen cattle killed for the butcher's stall at two years old which made admirable beef.

The Black cattle flourish on a variety of soils, the limestone, the red sandstone, and the clay-slate formation making no appreciable difference in the size of the animals. A damp and moist atmosphere suits them very well indeed, at an average temperature of about 52°. I may add that they are very hardy and do well as outlyers, if tolerably well kept; they improve most rapidly when the spring comes on and the early grass begins to grow. I entertain the idea that the Black cattle are the most paying breed now under a farmer's care. The grasses on the permanent pasture are principally clovers, trefoil, cock-grass, the different fescues, timothy, and foxtail. The grasses used in farming rotation are red clover, Dutch clover, rye grass, trefoil, and cock-grass.

The Earl of Cawdor, who is the principal exhibitor of Black cattle in England, and whose animals generally reach 22 to 23 cwt. at Smithfield, says:

Their prevailing color is black, with long thick hair, long yellow horns, body even and well shaped. They are hardy in constitution, strong, docile, useful for labor, when necessary, and subsisting on scanty herbage. Their flesh is of excellent quality, fine grain, well mixed, and the extra fat more inside than immediately under the skin. The milking properties of this breed are on an average extremely good, each cow giving from 12 to 14 quarts daily. The quantity, quality, color, and flavor of their butter cannot be surpassed. They get to maturity at an early age, but, like every other breed, that depends entirely upon the feeding. Live weight of bulls, 24 cwt.; oxen, 22 cwt.; cows, 18 cwt. The hardiness of the breed renders them suitable as outlyers, and they rapidly gain flesh. There is a very satisfactory improvement noticeable in the breed of this cattle, and in a few years more they will claim an honorable position among the varied breeds of Great Britain. The soil here is brownish, light, dry loam, of good depth, or a sort of mixed limestone, well adapted for growing excellent crops of swedes, mangels, &c., and it will grow heavy crops of oats (black better than white) and barley. The yield of grain is only fair in finding properties. Most sorts of grasses are grown in this neighborhood, but clover is not a certain crop. The climate is damp and changeable, but extremely mild, the spring often late and cold, with a prevailing east wind.

The annual rainfall of the districts occupied by the Black cattle is about twice the amount of that of Chiswick, and the westerly winds are very strong.

Mr. George F. Bowden says:

It requires a hardy race to stand the exposure during the winter to which the Black cattle, without any shelter except the high hedges, are subject, and this quality of hardiness of constitution is possessed by the Blacks. In their coats and general appearance they show the first approach of the genial spring. There is no animal which commands so good a price in the fairs as a bullock that has been wintered out in the fields and shows fair condition and a good coat. To those who wish to be possessed of a good herd of Blacks I would say, avoid all attempts at crossing—such attempts have never yet succeeded—but purchase the best pedigree bull of as good a strain as you can get for the money. As to rearing and feeding for milk, a few years ago I purchased some of the best cows to be procured in calf to noted bulls. I was enabled to have this rare opportunity by being acquainted with several of the best breeders. I have tried Shorthorns, and I have had the best of cows procurable for milk and feeding purposes, but I prefer the long horn Black cow, which gives rich milk, thick cream, and makes beef not to be surpassed, quite equal to Scots, and commands as good a price. They drop better and hardier calves, and I have never, so far, lost a calf. I have had cows calve about November and December, and all times of the year. I keep the cow and calf in for, say, one month and then turn them out. They stand the winter wonderfully well, and will do well on hay and chop; sometimes I use turnips and rice meal. I never tie up any only those I milk and finish off for the butcher. Some calves I have reared upon their mothers' milk, and I do not know whether this does not pay best in the long run, and is more natural. The calves reared in this way at one year old are as big and have better hair and coats than those reared by hand at two years old. I do not believe in allowing the calf to suck the cow and keeping the calf in the shed, but rather in allowing it to have its freedom with its mother on the grass. It then learns to eat with her, and when they are separated it does not feel so much the loss of the mother's milk and is better prepared to get its own living. Other calves I rear on skim-milk, calf meal, and a little dissolved oil-cake. I find that new milk for one month is the best way to start a calf. After four months I begin to give them chop, rice-meal, and linseed-cake, and continue this through the winter, all given out of doors. I find also that for feeding purposes it best answers to buy barren heifers and bullocks turned three years old. If bought at two years old they want summering and wintering in the sheds on turnips, hay, rice meal, Indian meal, and linseed-cake, and then they come out good ones at three years old and very fit for the butcher. This is my experience, having bought several trucks for myself and others. If it pays the Welsh farmers to keep this class of cattle on poor land and poor feed, surely they ought to do something on good land and good feed.

JAMES LONG.

HEICHIN ENGLAND, 1883–'84.

SELECT BREEDS OF BRITISH CATTLE.

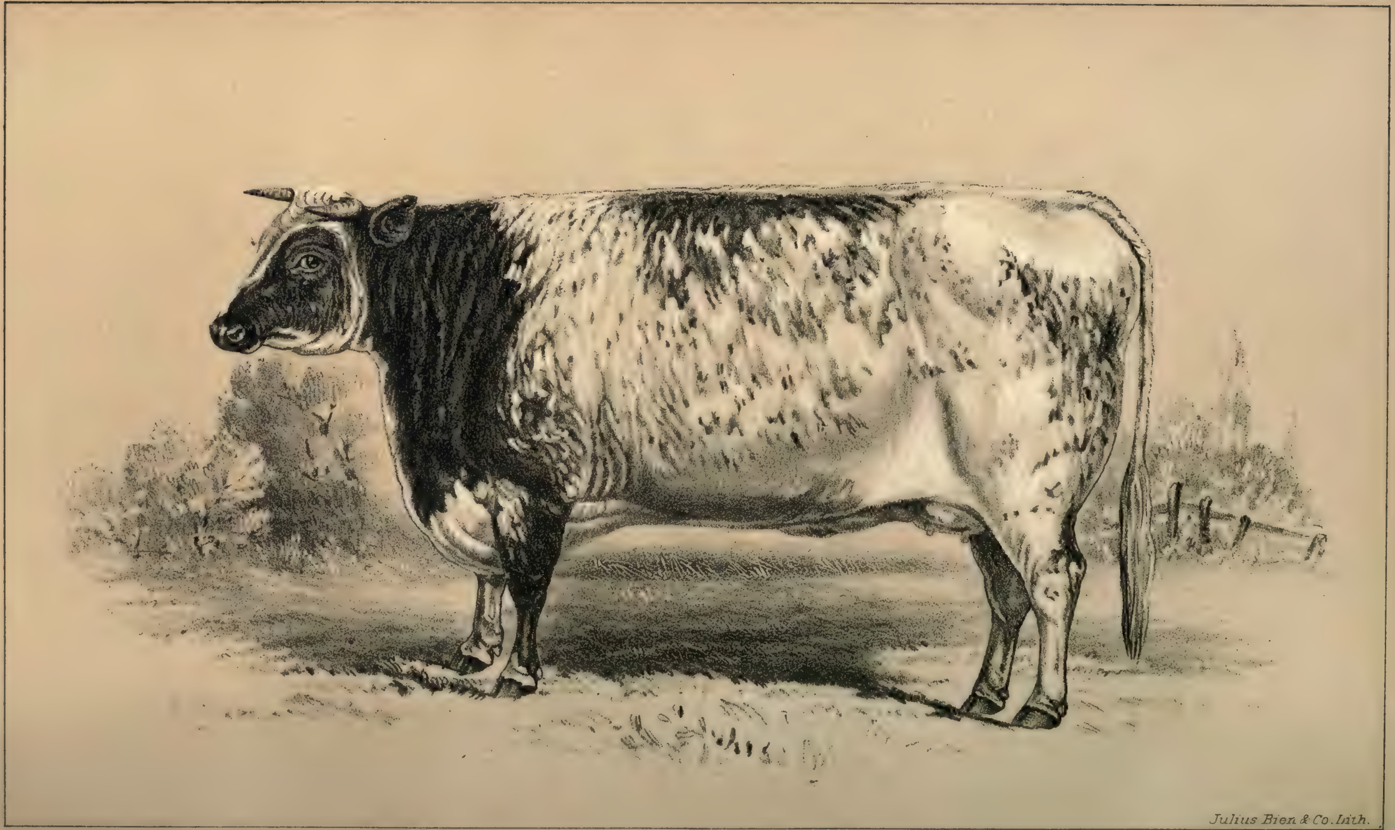
REPORT BY CONSUL PACKARD, OF LIVERPOOL.

INTRODUCTORY AND EXPLANATORY.

I have the honor to acknowledge the receipt of circular dated July 18, 1883, in reference to the breeding cattle in this country and requesting me to report upon the same.

The difficulty of collecting reliable information has been very great. This consulate being far removed from the agricultural and farming districts has necessitated the writing of a large number of letters to

PLATE 23

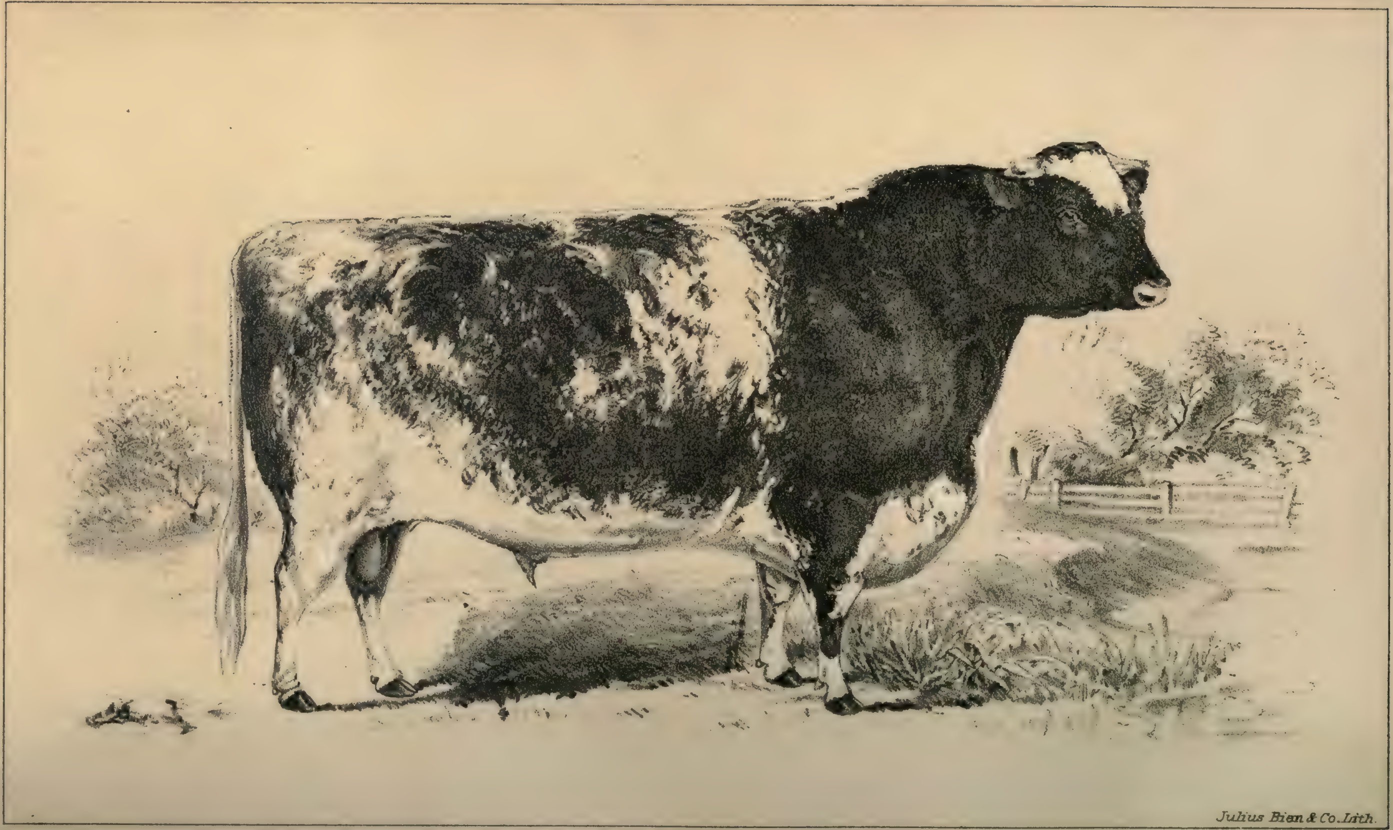


Julius Bien & Co. Lith.

Shorthorn DEVON COW.

OWNED BY M T H HUTCHINSON MANOR HOUSE CATTERICK, YORKSHIRE

PLATE 22


Julius Bien & Co. Lith.

SHORTHORN BULL

OWNED BY MR T H HUTCHINSON, MANOR HOUSE, CATTERICK, YORKSHIRE prominent breeders. In many cases the breeders excused themselves answering the questions on account of their voluminous nature. For much of the information I have been able to obtain I am greatly indebted to Mr. George de la Perrelle, of Litherland, near Liverpool, a well-known shipper of select stock for breeding purposes to Canada and the United States.

There are in this country numerous breeds of cattle, but as a number of these are considered of inferior sorts, I have thought it best to report only of such breeds as excel in merit for the dairy or beef-making purposes, and at the same time suitable to our climate and soil, such breeds as are usually selected by the buyers who come over here to secure those best adapted for exportation to the United States. They are as follows: Shorthorns, Devons, Sussex, Herefords, Red Polled, Polled Angus or Aberdeen, Welsh, Jerseys, and Ayrshires.

THE SHORT-HORN CATTLE.

Some of the best herds of this celebrated breed are to be found in orkshire and the north and northwest counties of England, but more or less all over Great Britain.

The following descriptions of the Short-horn and other breeds hereinafter treated are more or less borrowed from eminent English writers on cattle, and suggest strongly the points of excellence which should be considered by the buyer of thoroughbred neat stock.

This breed possesses, in an eminent degree, a combination of qualities, and are rendered attractive to the eye by their splendid frames and beautifully varied colors; they have become objects of public curiosity, and have realized for their breeders enormous sums of money.

The following may be taken as a fair specimen of a Yorkshire cow:

> A milch cow, good for the pail as long as wanted, and then quickly got into marketable condition, should have a long and rather small head; a large-headed cow will seldom fatten or yield milk. The eye should be bright, yet with a peculiar placidness and quietness of expression; the chaps thin and the horns small. The neck should not be so thin as that which common opinion gives to this milch cow. The dewlap should be small; the breast, if not so wide as in some that have an unusual disposition to fatten, yet far from being narrow, and it should project before the legs; the chine to a certain degree fleshy; the girth behind the shoulder should be deeper than is usually found in the Short-horn; the ribs should spread out wide so as to give as globular a form as possible to the carcass, and each should project farther than the preceding one, to the very loins. She should be well formed across the hips and on to the rump, and with greater length there than the milker generally possesses, or, if a little too short, not heavy. If she stands a little long on the legs it must not be too long. The thighs somewhat thin, with a slight tendency to crookedness; the tail thick in the upper part but tapering below, and should have a mellow hide and little, coarse hair. The quantity of milk given by some of these cows is very great, and no uncommon thing to yield thirty quarts per day in early summer, but the average may be estimated at twenty-two to twenty-four quarts. It is said that this milk does not yield a proportionate quantity of butter, and that although these cows may be valuable when the sale of milk is the prime object, they will not answer for the dairy. That their milk does not contain the same proportionate quantity of butter as that of the Long-horns, the Scotch cattle or the Devons is probably true, but more than compensated by the additional quantity of milk.

It also appears that they accumulate flesh and mature more rapidly than any other breed, and, in consequence, take the foremost rank of all neat cattle.

The colors are roan, white, red, and white and red.

Animals.	Average weight at maturity.	Average size at maturity.	
		Girth.	Height.
	Cwt.	*Inches.*	*Inches.*
Cow	16 to 18	90 to 100	56 to 60
Bull	18 to 20	90 to 110	58 to 64
Ox	20 to 22	90 to 110	58 to 64

Age at maturity: Three years.
How long bred pure: Supposed to be descended from the white cattle of Great Britain. Improvement of breed began about the year 1780.
Annual average pounds of milk: 11,500 pounds.
Milk to pounds of butter: 40 pounds to 1 pound butter.

Product.	Quantity.
Meat	Two-thirds of gross weight.
Milk ....pounds..	12,500

Labor: Little.
Method of housing: Young stock are housed from November to March, and fat and milch cows are housed at night from October to May.
Feeding: Fed in the morning with hay, roots, and oil-cake and Indian meal, then turned out on the pasture.
Breeding: Commence at two and one-half years.
Grasses: Rye-grass and clover.

The following are some of the live weights of fatted cattle of this breed:

Oxen exceeding 3¼ *and not exceeding* 4 *years old:* No. 1, 2,029 pounds; No. 2, 2,164 pounds; No. 3, 2,395 pounds; No. 4, 2,510 pounds; No. 5, 2,424 pounds; No. 6, 2,149 pounds; No. 7, 2,184 pounds; No. 8, 2,296 pounds.

Steers exceeding 2½ *and not exceeding* 3¼ *years old*; No. 1, 1,715 pounds; No. 2, 1,883 pounds; No. 3, 1,666 pounds.

Cows: No. 1, 4 years 2 months old, 1,874 pounds; No. 2, 4 years and 2 months, 2,022 pounds; No. 3, 4 years and 9 months, 1,604 pounds; No. 4, 9 years and 8 months, 2,177 pounds.

Decrease: In consequence of the high price of meat a large number of prime 2-year-old heifers are being slaughtered, thus decreasing the number of animals.

Prices.—Prices of animals of this breed vary very much, and range from $125 to $5,100, according to pedigree. Prices have declined ever since the great sale at New York Mills, Oneida County, New York, in 1873. In order to compare prices which were realized at that sale with those of a recent and important sale of Short-horns in this country at Castle Hill Cerne, it is reported to me that at the former sale 93 cows, heifers, and calves realized the average price of $3,764.78 each, and 16 bulls at $1,922.81 each, while at the latter sale 32 cows realized $900 each (average), and the 6 bulls averaged $1,372. Seven Dukes and Duchesses averaged $3,625, and 4 Oxfords $1,105.

The soil of Yorkshire is for the most part black and brown.

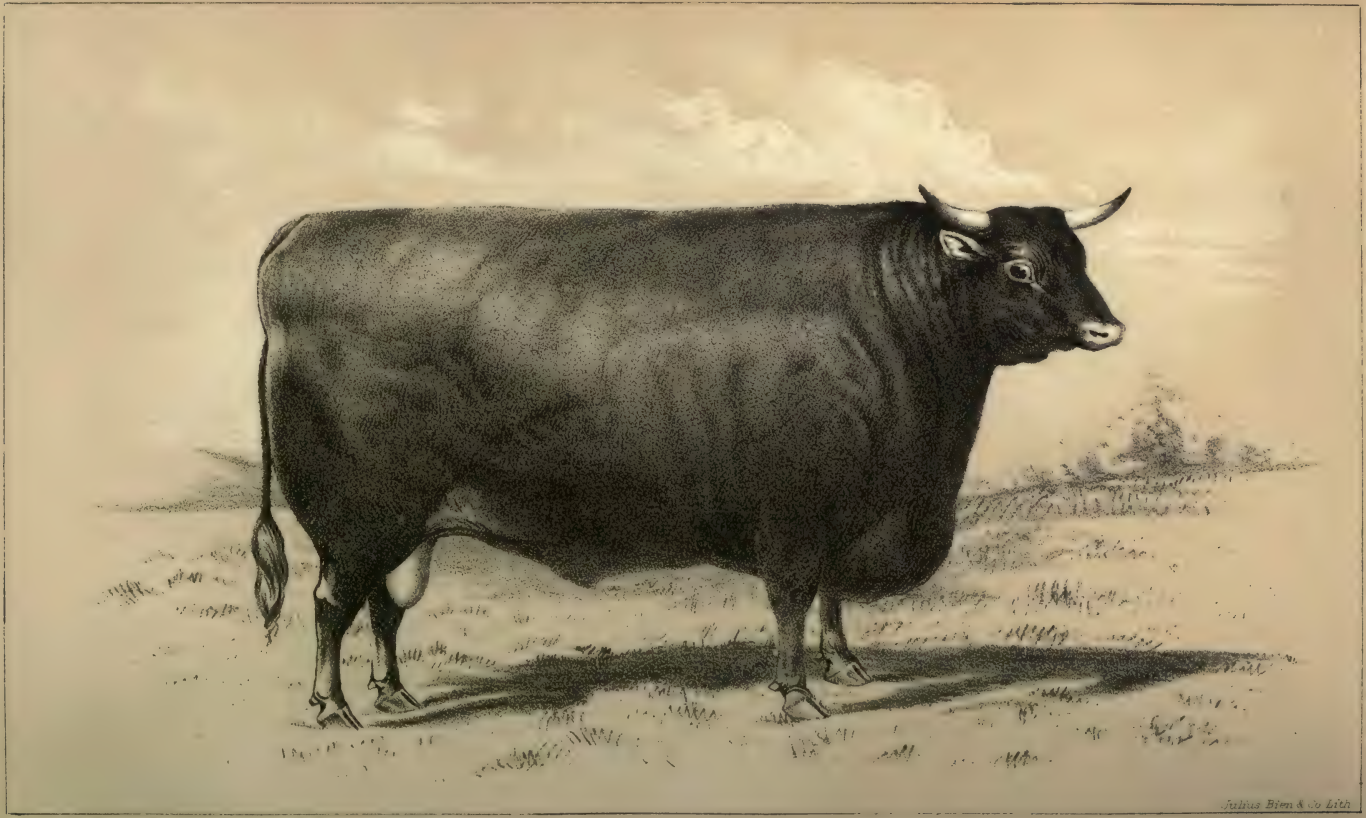
The substratum in some districts is clay, in others rock and gravel.

The temperature in summer is 62° and in winter 37°, the mean during the year being 49°.

DEVON CATTLE.

This breed is found in Devonshire and surrounding counties, and also in Ireland. Little is known respecting its origin further than that in

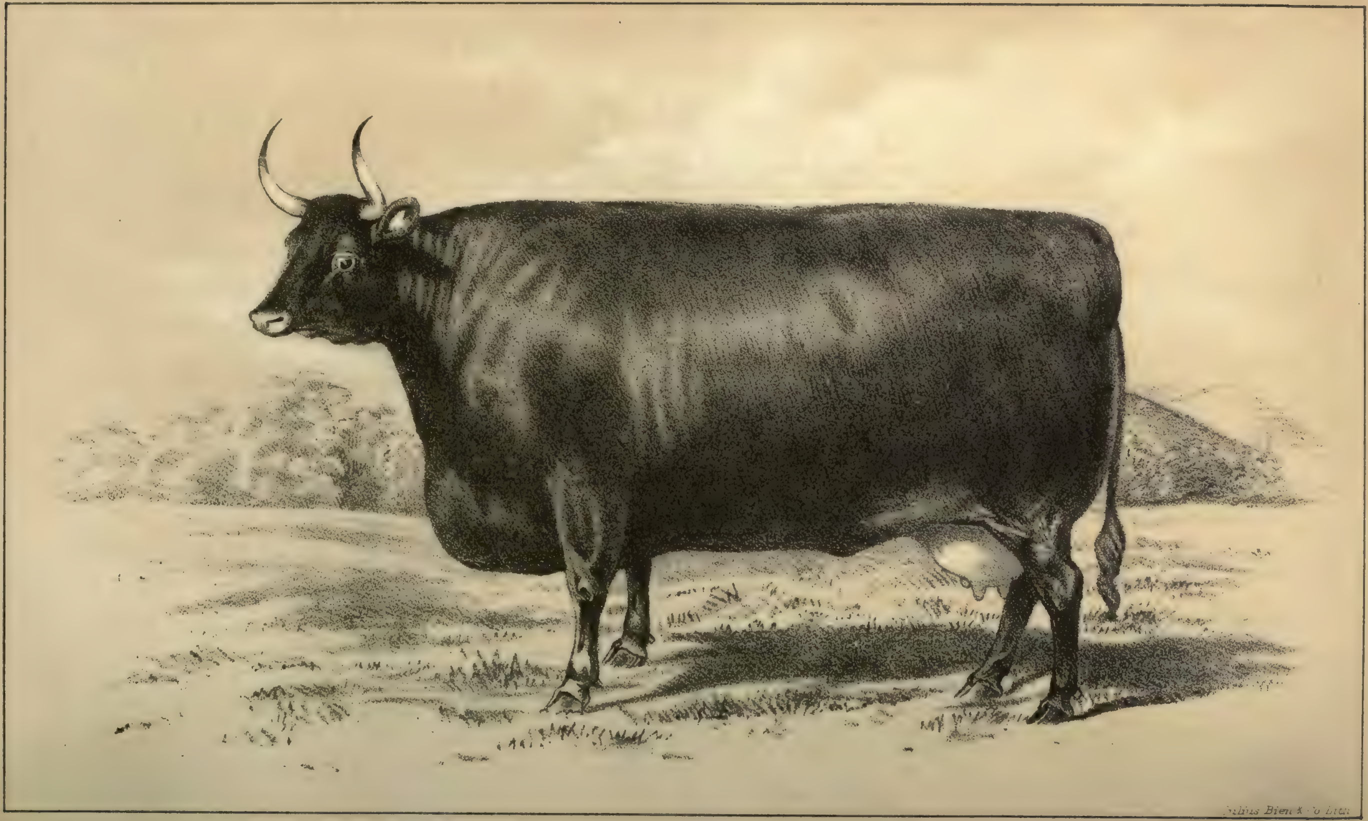
PLATE 24



Julius Bien & Co Lith

DEVON BULL

OWNED BY MR. JAMES DAVY OF FLITTON BARTON,
NORTH MOLTON, DEVON


Julius Bien & Co Lith.

DEVON COW

OWNED BY MR. JAMES DAVY OF FLITTON BARTON,
NORTH MOLTON, DEVON

the earliest records it can be traced as the peculiar breed of the county from which it takes its name. They belong to the "middle-horned variety," and in the opinion of some are the most suitable for paying from an all-round point of view; they are very quick feeders, and the high price of the Devon meat shows they are most salable animals—just equal to the Scotch—and that more per acre can be made from Devons at less cost and care. Those reared in the north of the county (Devonshire) are noted for their rich curly coat, but this they frequently lose when taken away from their native home. They, however, bear the change of climate and soil well, thrive where many breeds would starve, and rapidly outstrip most others when they have plenty of good pastures.

Those in the south of the county, known as the "South Hams breed," from the district from which they are bred, appear to be a mixture of North Devons with the Guernsey and are large-framed, coarse-boned, good milkers, with hardy constitutions and large offals. According to some the North Devon differs from the South Devon in everything which is necessary to constitute a good animal. Each breed, however, has its own particular merits, each answering a better purpose than the other according to the climate, soil, situation, and other circumstances in which it may be placed. The Devon breed is most valuable for its aptitude to fatten, delicacy of touch, and the choice quality of its beautified, veined, and marbled beef, the especial favorite of the butcher (who has a select family trade), for carrying the most beef in the most valuable parts, and for lightness of offal they stand unrivaled, The first herd-book was issued in 1851.

Description.—The general form of the Devon is very graceful, and exhibits a refined organization of animal qualities not surpassed by any breed. The head should be small, with a broad indented forehead, tapering considerably toward the nostrils; the nose of a creamy white; the jaws clean and free from flesh; the eye bright, lively, and prominent, encircled by a deep orange-colored ring; the ears thin; the horns of the female long, spreading, and gracefully turned up, tapering off towards the ends. The horns of the male are thicker set and more slightly curved, or in some instances standing out nearly square, with only a slight inclination upwards.

The color of the true Devon is a pure red.

Animals.		Average weight at maturity.
Cow	cwt	9
Bull	do	12
Ox	do	11

Age at maturity: Steers, four years; cows for breeding, four to six years.
How long bred pure: Aboriginal breed; special attention given to the breed since 1827.

In reference to the milk of the Devon cows, Col. J. J. Davy reports (1st November, 1883):

> A friend of mine last week tested one day's milking of his 40 cows, which give 47 gallons milk, which made 61½ pounds of whole milk cheese. His neighbor's 40 cross-bred cows gave 61 gallons of milk, which produced only 56½ pounds of whole milk cheese. All the cattle were similarly kept.

From this it appears that 40 pure-bred Devons yielded 470 pounds milk, which gives 61½ pounds whole milk cheese, while 40 cross-bred

Devons yielded 610 pounds of milk, which gives 56½ pounds whole milk cheese.

Product.	Quantity.
Meat.................pounds..	1,232
Milk.................do....	6,000
Cheese (yearly).................do....	350 to 500

Labor: Little.
Method of housing: In pasture.
Feeding: Grass, turnips, &c., and cake.
Breeding: Commence at two years.
Grasses: Rye, clover, &c.

The following are some of the recorded weights of this breed.

Devon steers not exceeding 3 *years old:* No. 1, 1,568 pounds; No. 2, 1,349 pounds; No. 3, 1,294 pounds; No. 4, 1,197 pounds; No. 5, 1,383 pounds; No. 6, 1,285 pounds; No. 7, 1,323 pounds.

Devon cows: No. 1, 5 years old, 1,211 pounds; No. 2, 5 years and 8 months old, 1,333 pounds; No. 3, 5 years 1 month, 1,420 pounds.

Devon heifers under 4 *years old:* No. 1, 1,276 pounds; No. 2, 1,153 pounds; No. 3, 1,284 pounds; No. 4, 1,019 pounds.

The price is various, but moderate when compared with those of other breeds.

The surface of North Devon (where this breed is found in the greatest purity) has moorish, mountainous grounds on the east and west, but presents over the most parts a rich display of varied contour, fertility, and beauty.

The soils are mainly pure yellow or white clays, and partially clayey loam.

The substratum is old red sandstone or Devonian rocks.

The temperature in summer is 60°, in winter 39°; the mean during the year 51°.

SUSSEX CATTLE.

This breed is to be found principally in the counties of Sussex, Kent, and Surrey.

The progress made in recent years by Sussex stock has proved it to be one of the most profitable of breeds. They "make meat" very rapidly, perhaps more so than any other breed, and their admirers are pleased to state that this was clearly demonstrated in 1878 at the Smithfield Club cattle show. The first herd-book was published in 1860. The color is red.

Animals.	Average weight at maturity.
Cow.................cwt..	14 to 17
Bull.................do...	15 to 20
Ox.................do...	17 to 20

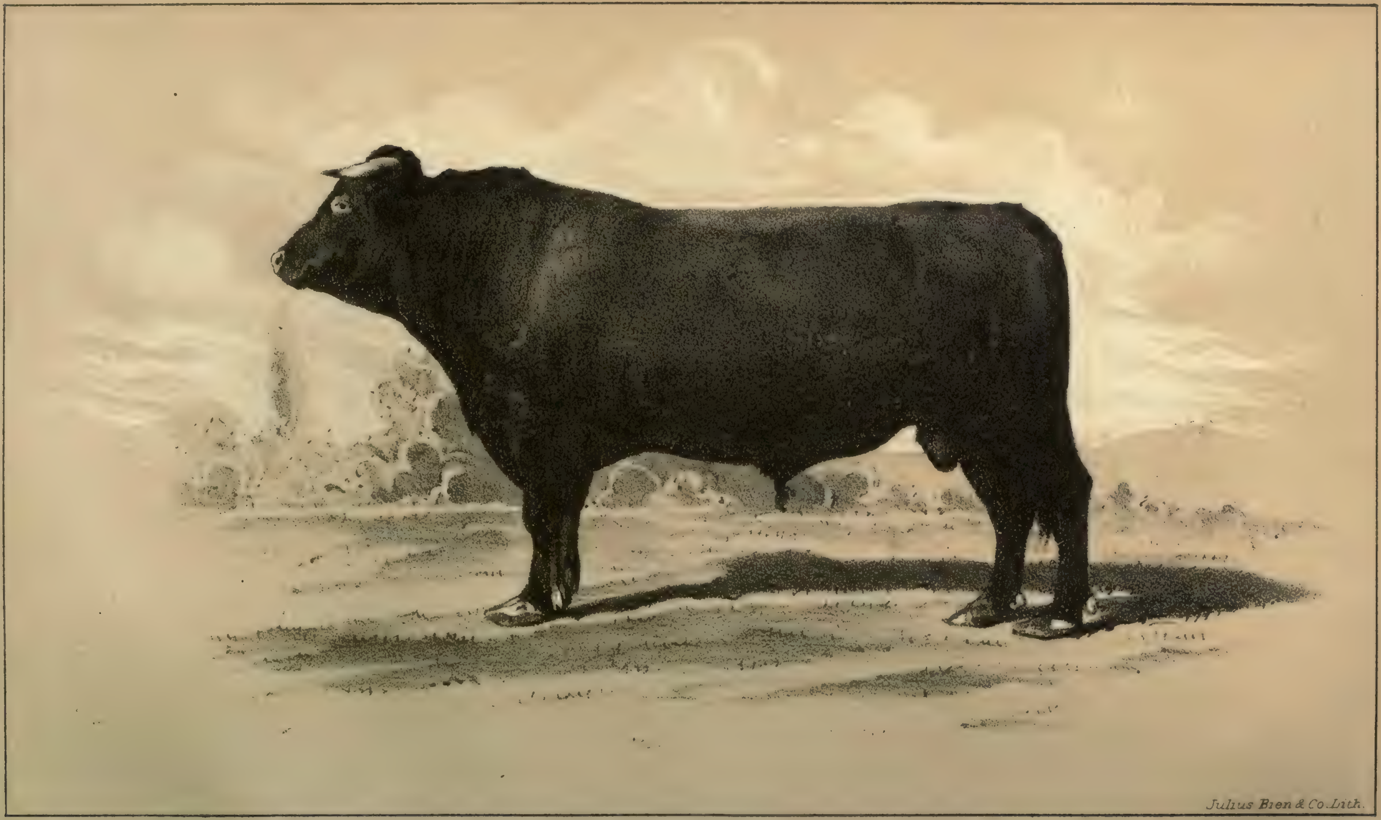
Age at maturity: Two to four years.
Annual average pounds of milk: About 3,000 pounds.

The annual yield of butter is about 200 pounds.

The price varies according to quality. Cows from $88 to $97.

The county of Sussex is described as a maritime county. It contains but few hills, none of which obtain 1,000 feet high.

PLATE 26

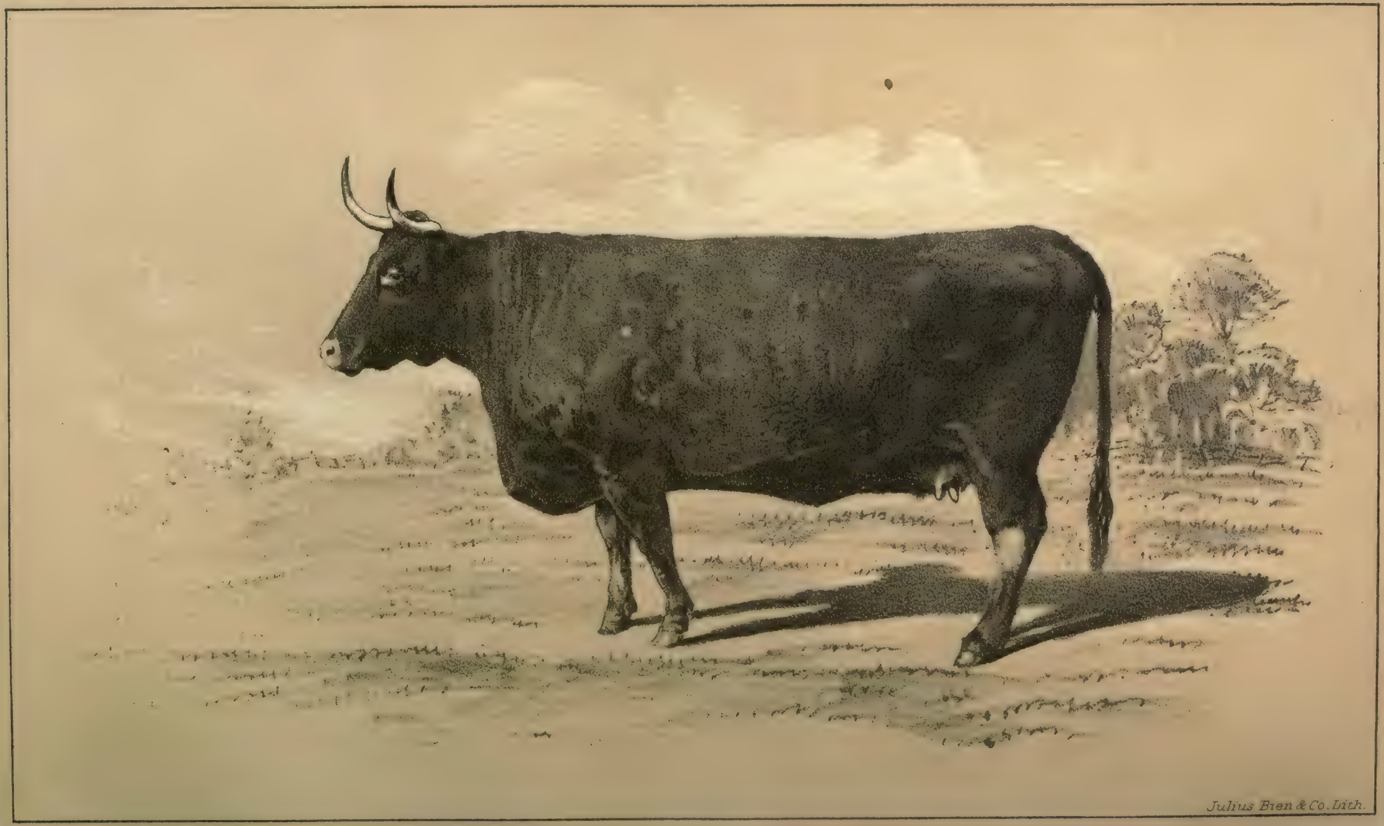


Julius Bien & Co. Lith.

SUSSEX BULL

OWNED BY MR. JOHN PLUMER, HORSHAM, SUSSEX.

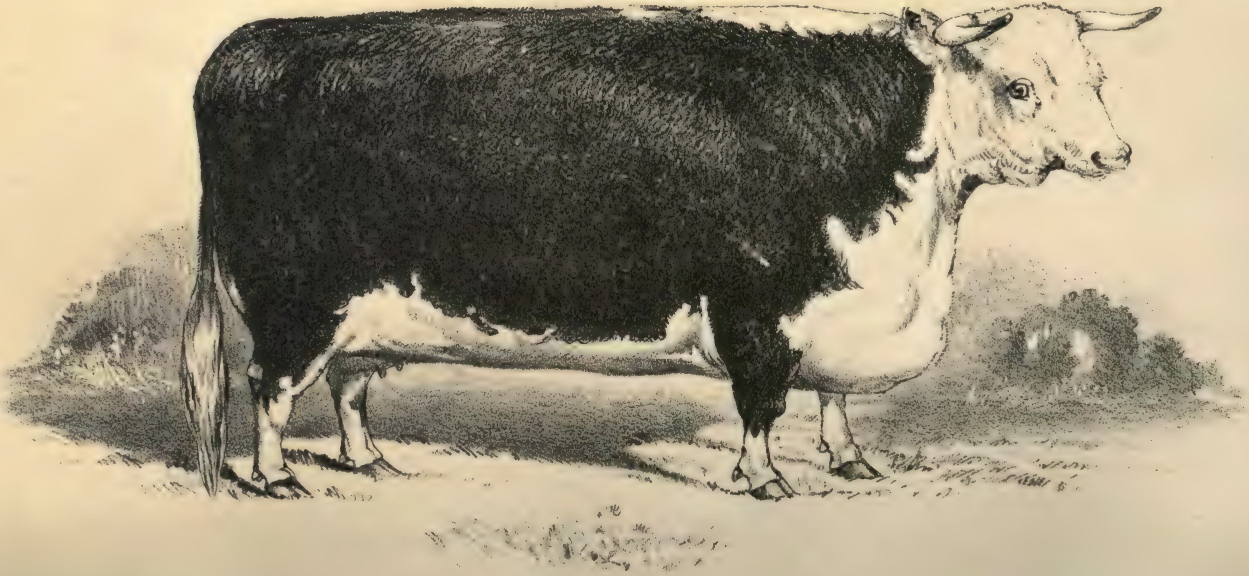
PLATE 27



Julius Bien & Co. Lith.

SUSSEX COW

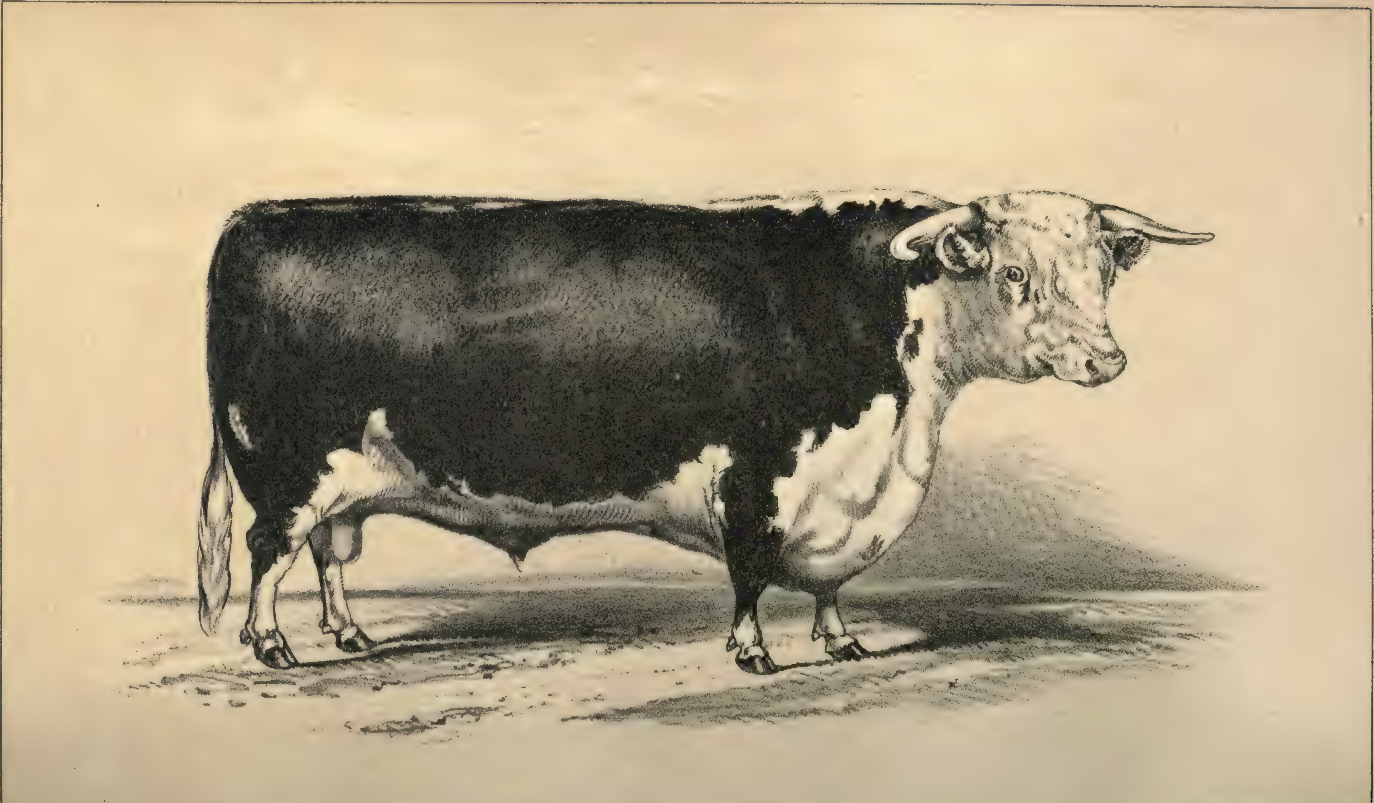
OWNED BY MR. JOHN PLUMER, HORSHAM, SUSSEX.



[illegible]

HEREFORD COW.

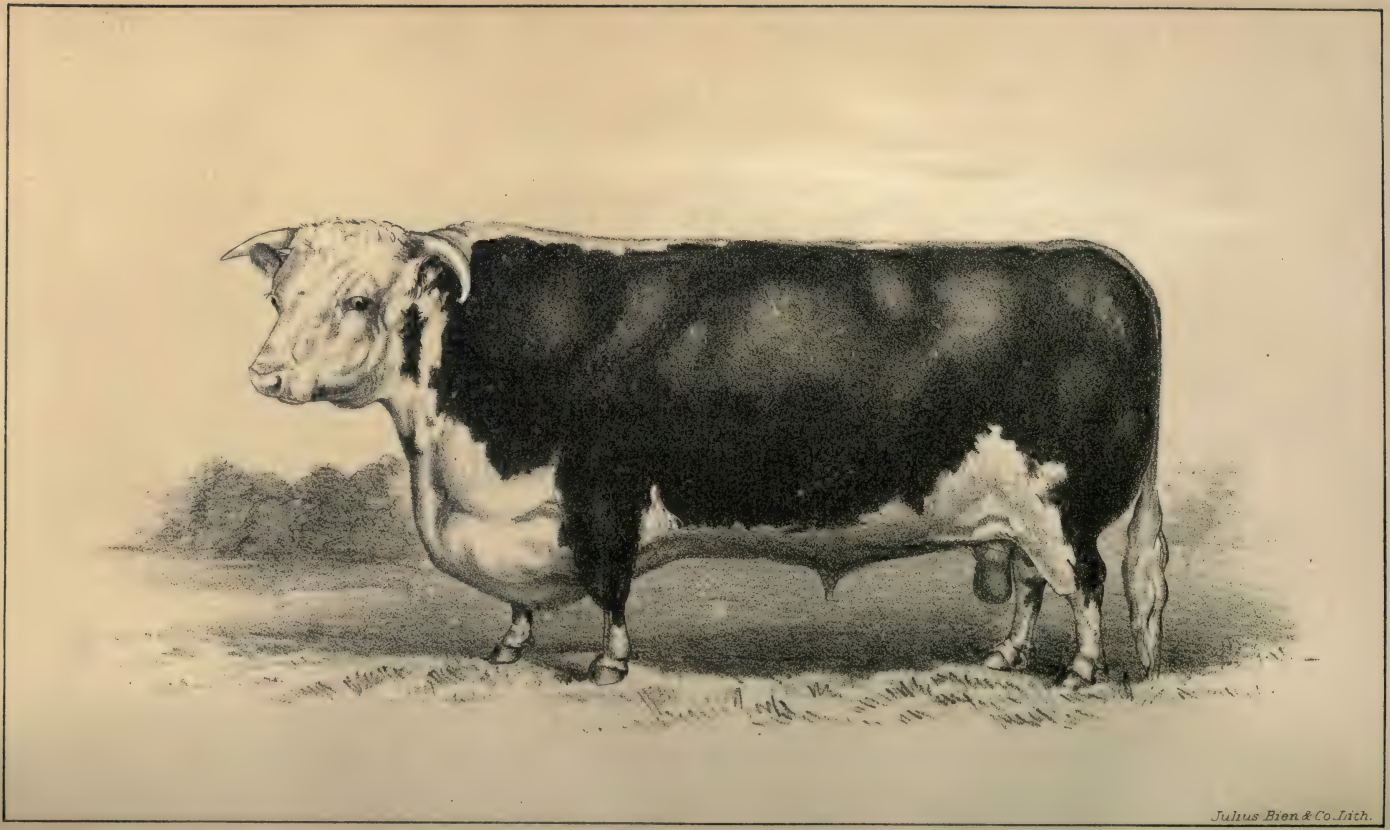
OWNED BY MR JOHN H YEOMANS, STRETTON COURT, HEREFORD.



Julius Bien & Co. Lith.

HEREFORD BULL.

OWNED BY MR JOHN H. YEOMANS, STRETTON COURT, HEREFORD.



Julius Bien & Co. Lith.

"FISHERMAN," AT 5 YEARS 2 MONTHS OLD

THE PROPERTY OF THE EARL OF COVENTRY, CROOME COURT, WORCESTER, BRED BY MR. T. ROGERS, COXALL, BRAMPTON BRIAN

The soil generally compares with the underlying rocks, and varies from sterile sand to very stiff loam.

The substratum is lower greensand rocks, chalk, and lower Eocene rocks.

The temperature is 63° in summer, 38° in winter, and the mean temperature 50°.

HEREFORD CATTLE.

This breed takes its name from the county where they were first bred, but they are to be found also in the adjoining counties. They are also grazed in most of the great grazing farms of the midland counties, and there are also breeding herds in Scotland and Ireland. The Queen's celebrated herd is kept near Windsor, Berkshire. This breed adapts itself easily to the severe climate of the north, as well as the milder climate of the south.

In America some are to be found in ranches 6,047 feet above the level of the sea, and no better proof can be given of the hardiness of the Herefords.

Of this breed the Earl of Coventry says:

> I have observed Hereford cattle for twenty years, but I only commenced forming a herd nine years ago. During that period I have tried them alongside pedigree Short-horns and other breeds of cattle, and I am so satisfied of the superiority of the Hereford breed for feeding purposes that I have disposed of other sorts. They are a hardy breed, doing well out of doors all the year round. Their quality of meat is very superior; they have less "rough" meat about them than the Short-horn, hence first-class butchers prefer them to other sorts. (21st October, 1883.)

They are a perfectly pure race of cattle and have been brought to their present excellence by the judicious selection of both male and female animals, and not by the introduction of crosses of other breeds. This strictly pure blood gives them the great value they have for improving other breeds.

Color.—The distinguishing color is red with a white face, chest, and belly, white flank and white tip to the tail; white on the legs, white mane, and often white line along the back The red with white face is invariable, and the white predominates, more or less, on different animals. There are also gray Herefords, but these are now confined to one or two breeds.

The date of the first herd-book is 1845.

Increase.—The demand for exportation principally for the United States and Canada has increased the stock of the district, owing to more farmers breeding.

Animals.	Average weight at maturity
Cow .... cwt..	12 to 14
Bull .... do..	16 to 20
Ox .... do..	20 to 22

Age at maturity: Three years.
How long bred pure: From a very remote period.
Annual average pounds of milk: Nine thousand five hundred pounds.
Milk to pounds of butter: Thirty pounds to 1 pound of butter.

A good cow has been known to yield 14 pounds of butter per week at grass; and also one gave 55 pounds of milk, yielding 2½ pounds of butter per day, but this is of rare occurrence.

Product.	Quantity.
Meat ....pounds..	1,770
Milk ....do....	9,500

Labor: Little or none.
Method of housing: Open yards during winter, with a run out by day; summer out in rough pasture.
Feeding: Hay, straw, and roots in winter; rough pasture in summer.
Breeding: Heifers have calves at two and a half years, and continue to breed till they are old.
Grasses: Clover, rye-grass, meadow, fox-tail, and English natural grasses.

The following is a record of the live weights of the fatted cattle of this breed:

	Oxen (over 3¼ and not over 4 years old).	Steers (over 2½ and not over 3¼ years old).	Heifers (not over 4 years old).
No. 1 ....pounds..	2,394	1,724	1,621
No. 2 ....do....	2,135	1,862	1,764
No. 3 ....do....	3,024	1,884	1,855
No. 4 ....do....	2,500	1,778	1,823

No. 1 ox (represented in the sketch) is the property of Mr. J. Price and was the winner of the Elkington challenge cup, which has never been done except by this Hereford. He is the true type with the markings for the Hereford.

Price.—At the recent total dispersion by auction of two old established herds the average price was just $375, including cows, bulls, and suckling calves. At one sale the leading bull sold for $4,139; at the other sale 12 two-year-old heifers averaged $652 each; the highest priced cow was $1,329. There were 117 animals in one sale and 91 in the other.

The soil of Herefordshire is various, from clay to light sandy soil, much of which is of inferior quality.

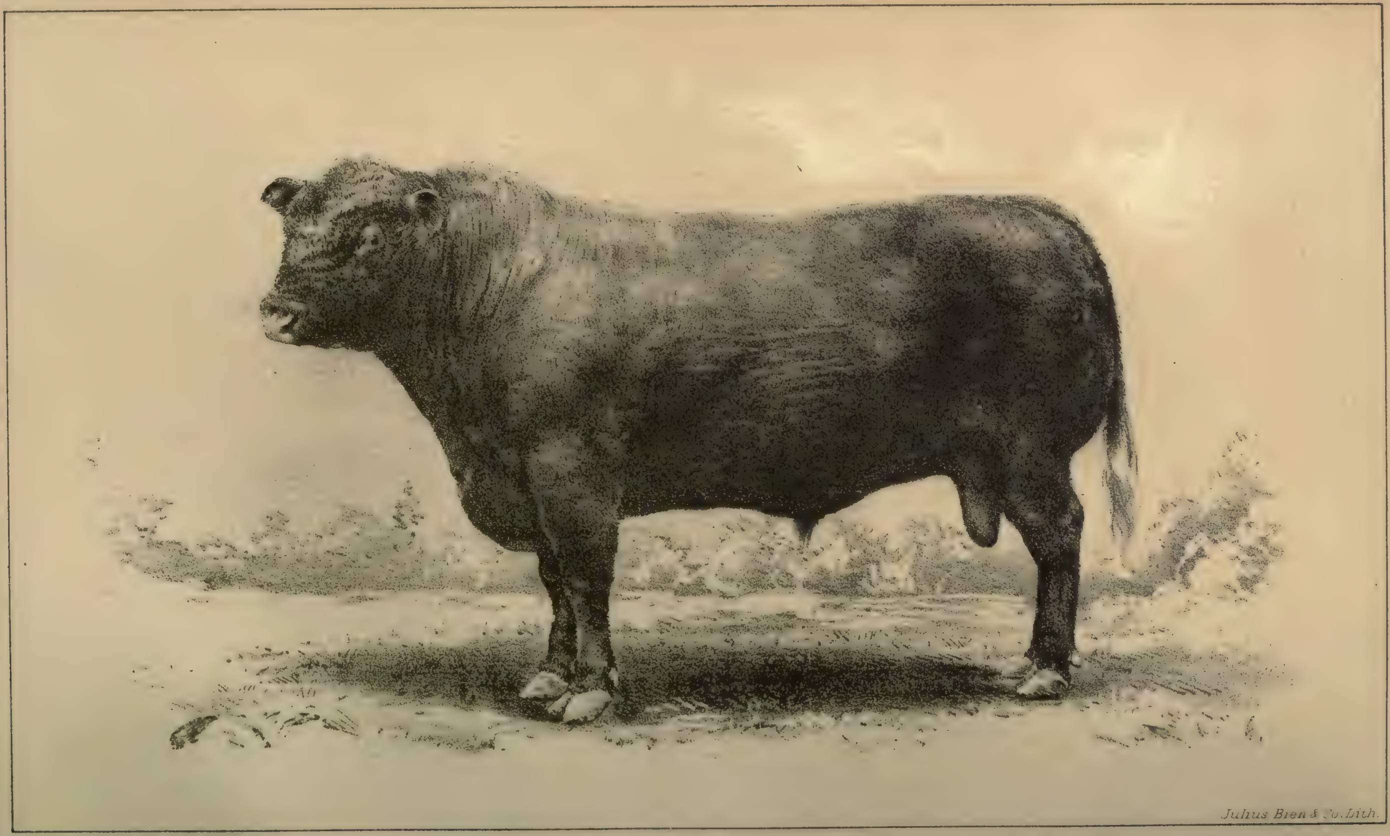
The substratum is principally limestone, clay, and gravel.

The temperature at the altitude of 100 to 300 feet above sea-level is in summer 60°; in winter, 39°; the mean during the year, 49°.

RED-POLLED CATTLE.

This breed of cattle is found principally in the counties of Norfolk and Suffolk, and its history can be carried far back into the last century. Formerly there were two varieties, and it is only since the year 1846 that the amalgamation of the two varieties, previously known as the Norfolk Polled and Suffolk Polled, has taken place, and the breed is at present known as the Suffolk and Norfolk Polled. Many of the old Suffolk Polled cattle were much more massive than the Norfolk, and this characteristic is yet in evidence. They could easily be picked out from a collection by the comparative coarseness at the head, a difference which is now but seldom manifest. In other points there were few divergencies in character between the two varieties.

PLATE 31

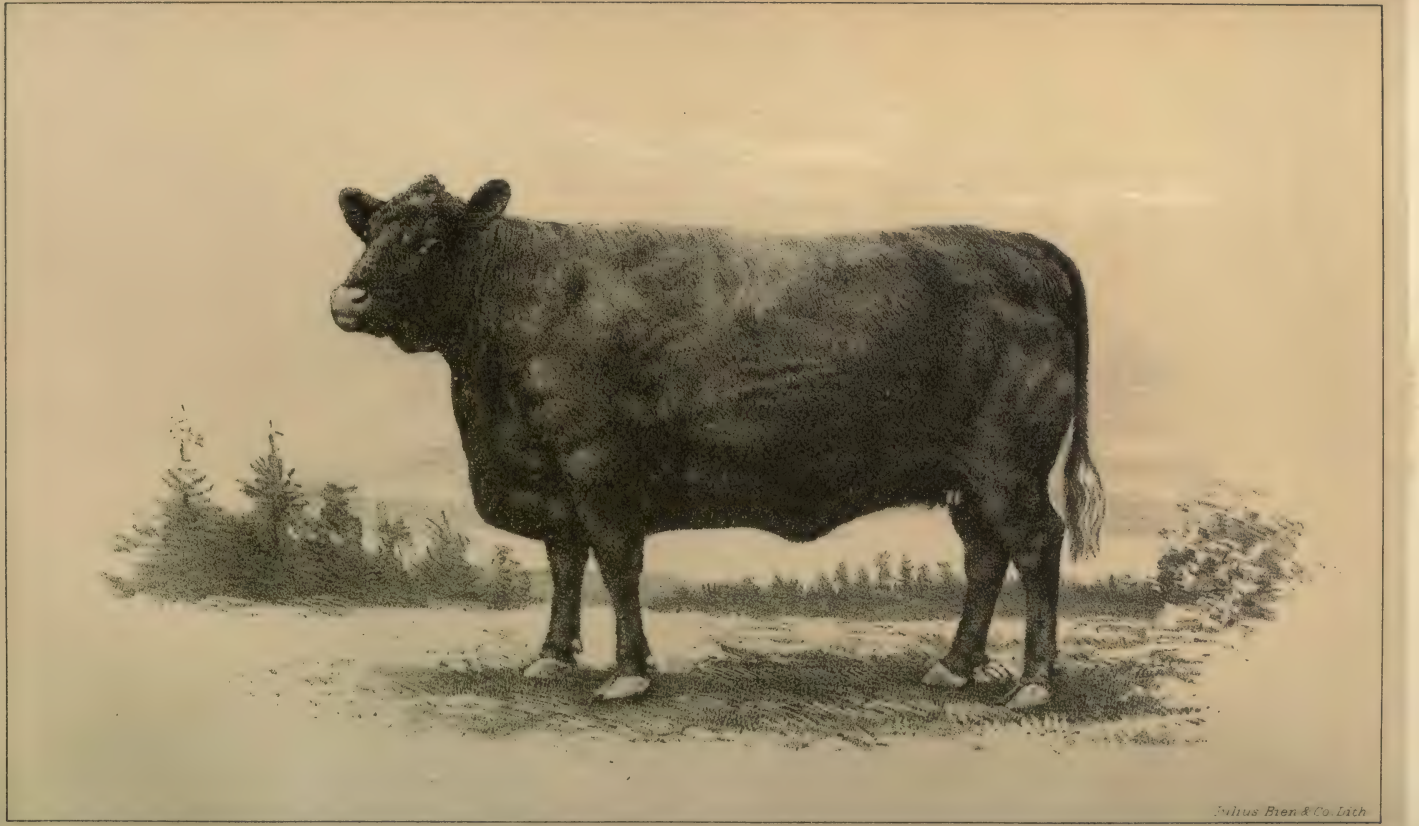


Julius Bien & Co. Lith.

RED POLLED BULL

OWNED BY J. J. COLEMAN ESQ. M. P. CARROW HOUSE, NORWICH

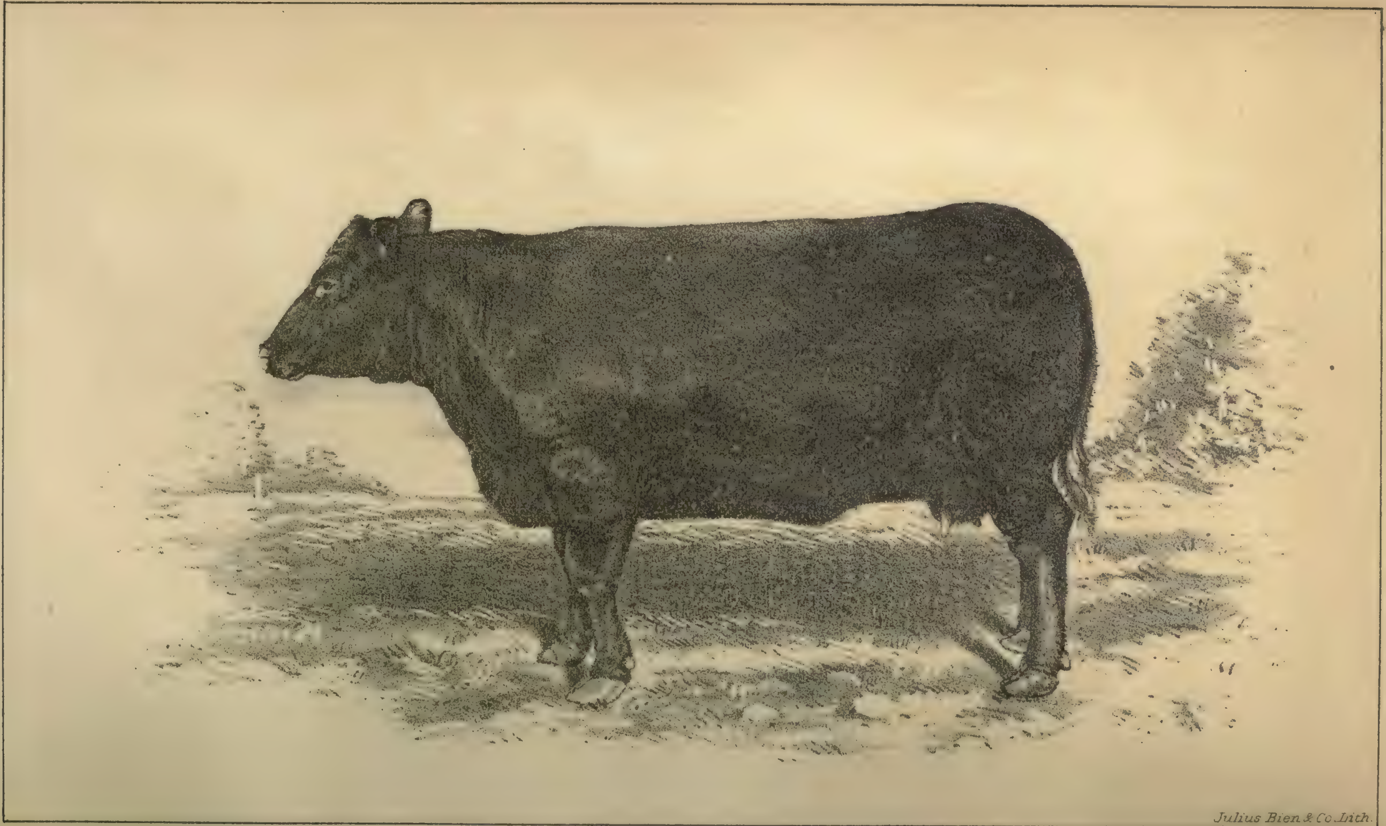
PLATE 32



RED POLLED COW

OWNED BY J. J. COLEMAN ESQ. M.P. CARROW HOUSE, NORWICH

PLATE 33



Julius Bien & Co. Lith.

RED POLLED COW

OWNED BY J. J. COLEMAN, ESQ. M. P. CARROW HOUSE, NORWICH

Red-Polled cattle are found to lay on flesh rapidly on pasture of the poorest quality where other breeds would require an additional supply of richer food. The dry temperature of their native home and the poor pasture seem more particularly to have their effect on the size of the stock.

As graceful as the Devon, the Red-Polled has the additional advantage of being hornless, in itself no little gain where horses also run in the pastures, or where the stock sent to market have to make a long journey by railway, boat, or road.

The first herd-book was issued in 1874.

The color and description of the breed, agreed upon by breeders in the autumn of 1873:

> The color red, but the udder may be white. The extension of the white of the udder a few inches along the inside of the flank, or a small white spot or mark on the under part of the belly by the milk veins, shall not be held to disqualify an animal whose sire and dam form part of an established herd of the breed, or answer all other essentials of the standard description.
>
> *Form.*—There should be no horns, slugs, or abortive horns.

The following are the points for a superior animal:

Color.—A deep red with udder of the same color, but the tip of the tail may be white, nose not dark or cloudy.

Form.—A neat head and throat, a full eye, a tuft or crest of hair should hang over the forehead; the frontal bones should begin to contract a little above the eye and should terminate in a comparatively narrow prominence at the summit of the head. In all other particulars the commonly accepted points of a superior animal are taken as applying to Red-Polled cattle. Clean, thin, short legs; a clean throat with little dewlap; a springing rib, with large carcass; a large udder, loose and creased when empty; milk veins very large and rising in knotted puffs to the eye, are points in a good Red-Polled cow.

Animals.	Average weight at maturity.
Cow .... cwt..	12
Bull .... do...	16
Ox .... do...	14

Age at maturity: Four years.
How long bred pure: One hundred years.
Annual average pounds of milk: 11,250 pounds.
Milk to pounds of butter: 35 pounds to 1 pound butter.

Product.	Quantity.
Meat .... pounds..	1,072
Milk .... do....	11,250
Cheese .... do....	336

Labor: Little.
Method of housing: In pasture.
Feeding: Grass, carrots, and beet roots, turnips and cake.
Breeding: Commence at two years.
Grasses: Clover and rye grass; no timothy.

WEIGHTS OF DEVON CATTLE.—The following are some of the weights of live cattle of this breed, as recorded by Mr. Euren:

No.	Age.	Weight.	Length from point to shoulder.	Total length.	Girth.
	Years.	*Pounds.*	*Ft. In.*	*Ft. In.*	*Ft. In.*
1.....	9	2,093	5 2	7 10	7 10
2.....	5	1,314	4 9	6 9	6 9
3.....	5½	1,320	4 6	....	6 4
4.....	6	1,436	4 11	....	6 8
5.....	6	1,427	5 0	....	6 7
6.....	3	1,281	....	....	....
7.....	3	1,354	....	....	....
8.....	7	1,514	5 0	....	6 8
9.....	8	1,659	5 2	....	6 6
10.....	3	1,350	....	....	....
11.....	6	1,472	....	....	....
12.....	9	1,649	....	....	....
13.....	3½	1,358	4 8	6 7	6 9
14.....	5	1,367	4 7	....	6 7
15.....	2¾	1,484	4 11	6 10	7 1

Also average daily yield of milk in pounds:

No.	Date of calving.	September.	October.	November.	December.	January.	February.	March.	April.	To May 21.
1.....	Fourth calf August 28................	50	48	47	45	43	42	40	33	20
2.....	Second calf September 7.............	52½	51	50	49	46	45½	44	40	32½
3.....	Third calf December 17...............	......	......	......	42½	40⅓	40	39	38	35
4.....	Third calf January 4	......	......	......	......	47½	45	43	42	40

Another test gave a daily average for five months of 51.30 pounds; for six months, 50.1 pounds; for seven months, 48.76 pounds.

Total from September 1 to March 31, inclusive, 10,341 pounds; to April 30, 11,196 pounds.

Decrease of stock.—This has in a great measure arisen from the fact of rinderpest having a few years ago been fatal to a large proportion of the cattle then in noteworthy herds. Fashion also has had a marked effect. Short-horns and Devons were at one time in such favor that polled cattle were despised and their merits ignored. There is, however, at present a marked progress made in the breed; shortness of numbers is being in some measure compensated for, noblemen and gentlemen now sparing no pains to make the breed a success.

Prices are from $195 upwards, according to pedigree.

The soil of Norfolk may be divided into three classes: Light sands of various qualities, low alluvial clays and loams, and loams of various qualities, chiefly light incumbent on a marly clay. Suffolk is nearly covered by diluvial beds.

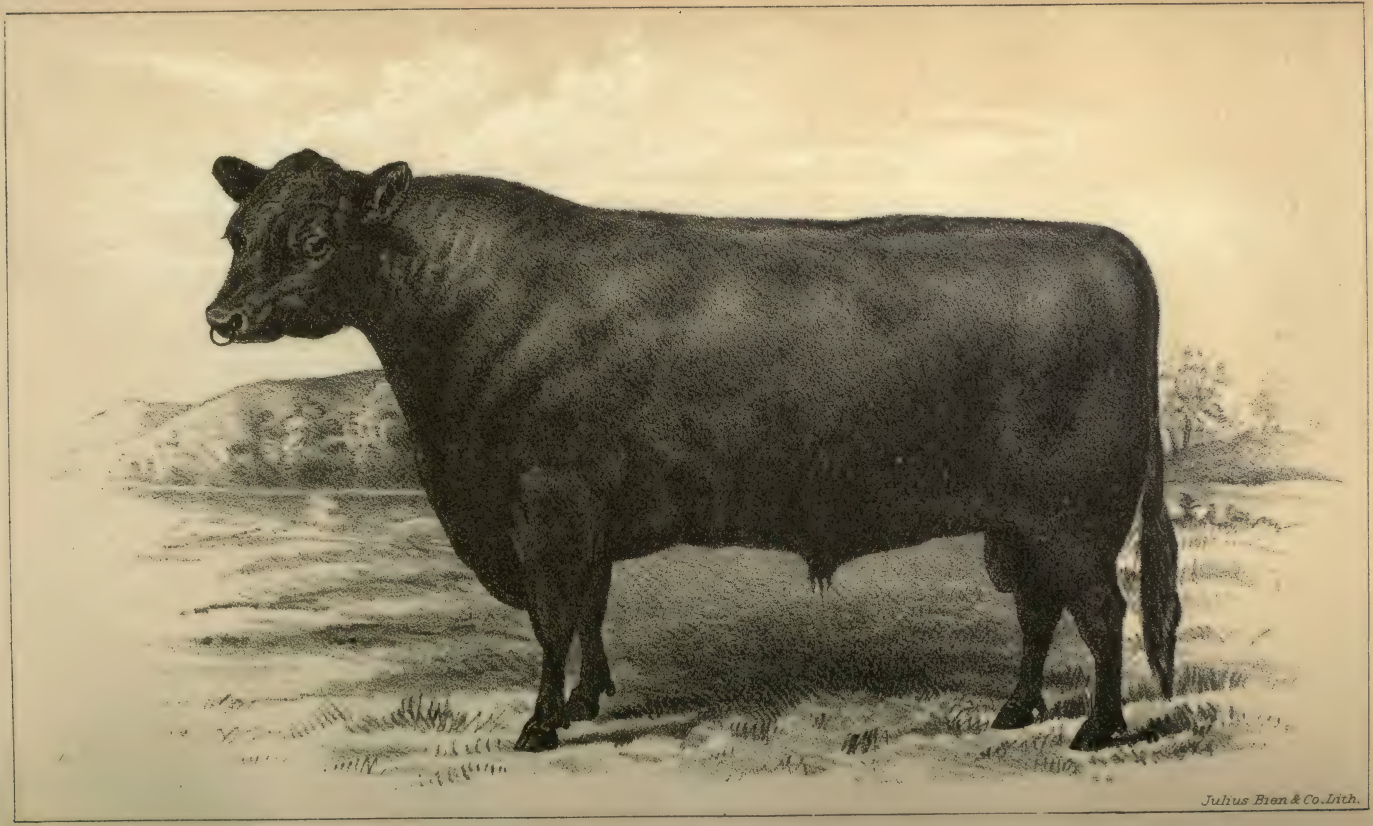
The surface is gently undulating except along the northwest and some parts of the northeast border, where it subsides into low, marshy levels.

The temperature of this part of England is 62 degrees in summer, 37 degrees in winter, and the mean during the year 49 degrees. The climate is somewhat colder than that of the southern and western counties.

THE ABERDEEN OR POLLED ANGUS CATTLE.

This breed is principally to be found in the northeastern counties of Scotland, Forfar and Aberdeen being the chief centers, and it has existed

PLATE 34



Julius Bien & Co. Lith.

POLLED ANGUS BULL

OWNED BY MR. CLEMENT STEPHENSON, SANDYFORD VILLA, NEWCASTLE ON TYNE.

there from time immemorial, but it was only in the year 1808 that some attention was given to improve it.

The first herd-book came out in 1862, and since that time the breed has greatly improved and has become somewhat famous for the excellent quality of its beef, which, according to some admirers, stands pre-eminently forward, both to the farmer and butcher, as being hardy and healthy, good milkers both in quantity and quality, easily fed, good beef producers, coming early to maturity, and highly prized by butchers. The color is black.

The description of a fine type of a Polled Angus is: The head of a male should not be large, but should be handsome and neatly set on. The muzzle should be fine, the nostrils of only moderate length, the eyes mild, large, and expressive; the poll high, the ears of fair size, lively, and well covered with hair, the throat clean, with no development of skin and flesh beneath the jaws, which should not be heavy, the neck pretty long, clean, and rising from the head to the shoulder top and surmounted by a moderate "crest," which contributes to masculine appearance, a desirable point in a bull. The neck should pass neatly and evenly into the body, with full neck vein. The shoulder blades should lie well backwards, fitting neatly into the body, and not lying awkwardly outside it; they should show no undue prominence on the shoulder top, on the points, or at the elbow. The chest should be wide and deep, the bosom should stand well forward between the fore-legs, and underneath should be well covered with flesh and fat. The crops should be full and level, with no falling off behind them; the ribs well sprung, neatly joined to the crops and loins; the back level and broad, the loins broad and strong, the hook-bones not too wide, narrower than in an average Short-horn; the quarters long, even, and rounded; the tail should come neatly out of the body, not too far up the back and not higher at the root than the line of the back.

The above description refers more correctly to bulls than to cows; the latter, of course, differ considerably in character; the head is much finer, the neck thinner and cleaner, with no "crest;" the shoulder top sharper, the bone altogether finer, the skin not quite so thick; the udder large, and milk vessels large and well defined.

Animals.	Average weight at maturity.
Cow ....cwt..	14
Bull ....do...	18
Ox ....do...	15 to 16

Age at maturity: Three years.
How long bred pure: Seventy years.
Annual average pounds of milk: 9,000 pounds.
Milk to pounds of butter: 27 pounds to 1 pound of butter.

Product.	Quantity.
Meat ....pounds..	1,456
Milk ....do....	9,000

Labor: Little.
Method of housing: In covered courts and stalled in winter, pastures in summer.
Feeding: Grass, turnips, straw, and cake.
Breeding: Two years of age.
Grasses: Clover and rye grasses.

Weight.—The following are some of the weights of fatted cattle of this breed: Steers not exceeding four years old, No. 1, 2,268 pounds; No. 2, 2,065 pounds; No. 3, 1,974 pounds; No. 4, cow, three years and eight months, 1,876 pounds; No. 5, three years, 1,710 pounds. Cattle intended for the London Christmas market are kept till three or four years old, and 1,232 pounds to 1,456 pounds (dead weights) are common weights.

There is no apparent scarcity of stock.

Price.—The average price realized at recent sales has been $180, and the highest price that has been paid for a polled animal was $1,385 in 1880.

The climate of the county of Aberdeen is described as on the whole mild, the winters not being so cold nor the summer so mild or so long as the southern counties.

The temperature is 57° in summer, 36° in winter, and the mean during the year 45°.

The soil on the uplands is very poor and thin, while the low-lying land has various soils, but most of it naturally poor and churlish, but has by judicious cultivation been converted into fine mold. Heaths and coarse, stiff clays are common in the higher districts, and light sands and fine clay in the valleys.

WELSH CATTLE.

There are two breeds of cattle in Wales. The North Wales breed is found in greatest perfection in Anglesea and Caernarvonshire. The South Wales breed is called the "Castle Martin" and the animals are very big, large bones and coarse, but they are not in favor in the north of the principality. The first herd-book for North Wales was published last year (1883), and great care and attention is now being given to the breed.

Color.—Both breeds are black, producing occasionally specimens of dun-colored and red. Characteristic points require that bulls should have white testicles and the cows white udders.

Age at maturity, 3½ years.

Live weight (average) at maturity is, cow, 13 to 14 cwt., bull, 15 to 18 cwt., and the ox 13 to 15 cwt.

The following are the weights of three oxen under four years of age: No. 1, 1,870 pounds; No. 2, 1,953 pounds, and No. 3, 2,108 pounds. The ox whose photograph is given herewith weighs actually 2,464 pounds and won the chief prize, "the breed cup" at Smithfield cattle show, 10th December, 1883.

Milk yield from a good cow is about 4,000 pounds annually; butter yield is about 300 pounds annually; no cheese is made.

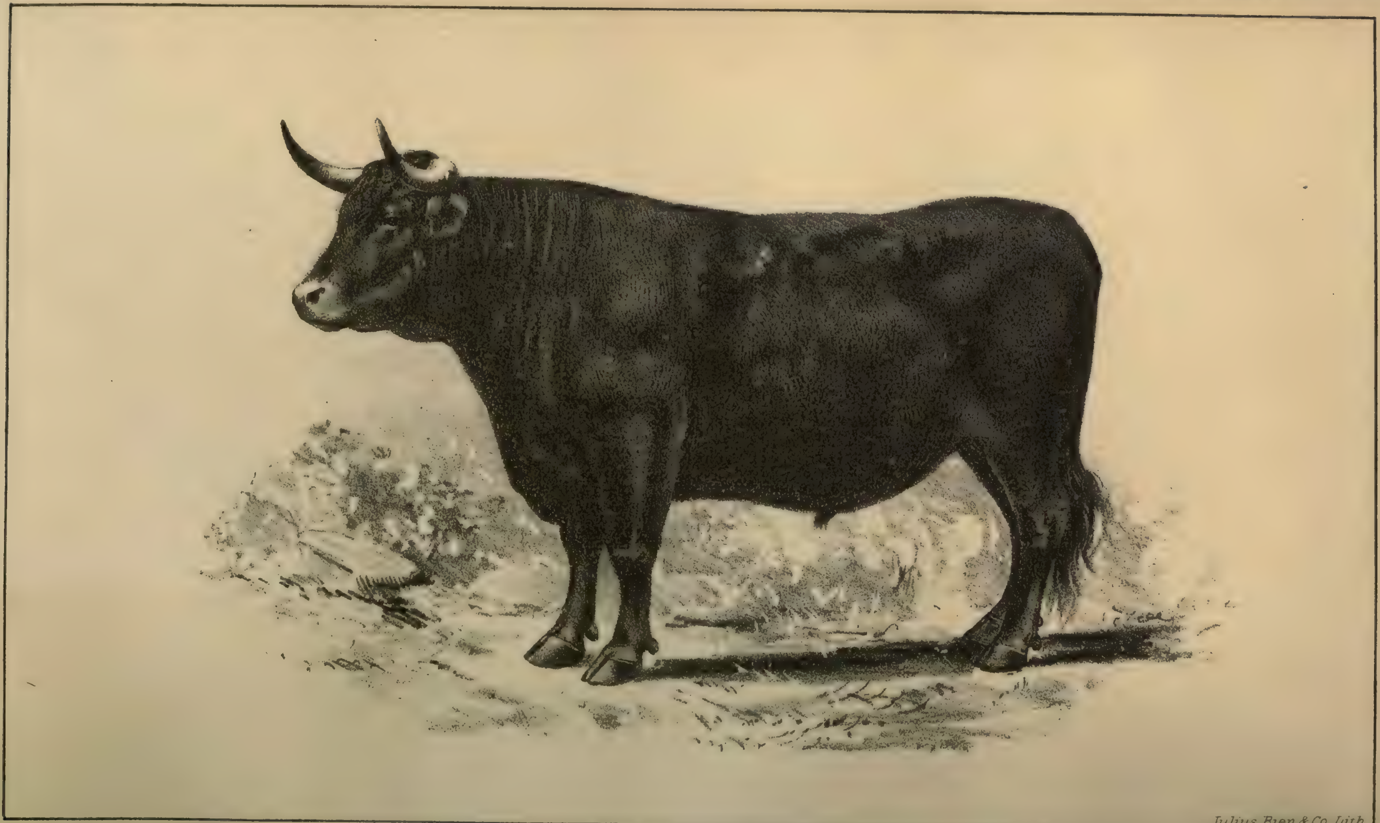
Price.—The average price for good oxen is from $88 to $98.

The Isle of Anglesea (where this breed is found pure) is described as being quite devoid of mountains or glens, flat in the south and center and only moderate hills on the north. The climate is mild but foggy, the temperature being 59° in summer, 42° in winter, and the mean during the year 50°. The soils are chiefly sandy loam, a stiff reddish earth, and blackish vegetable mold. The rocks are Cambrian, Lower Silurian, Lower Carboniferous, limestone and shale, granite, Permian conglomerate, sandstone, and red marl.

THE JERSEY CATTLE.

Jersey is justly celebrated for its breed of cattle, which goes under the name of the Alderney breed. There are about 12,000 cattle on this

PLATE 36

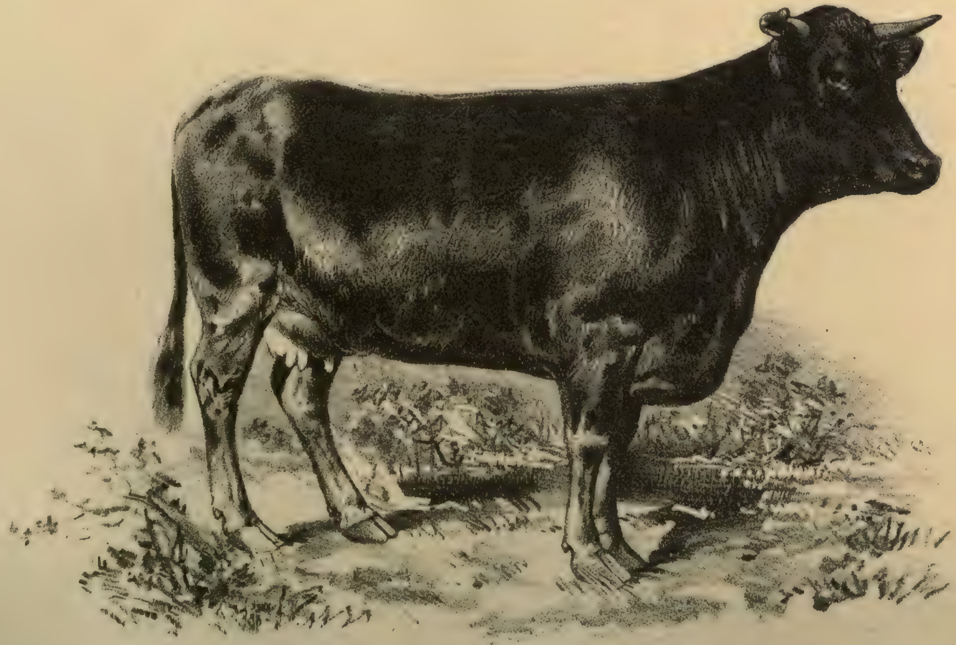


Julius Bien & Co. Lith.

WELSH OX

OWNED BY MAJ. HENRY PLATT, BANGOR

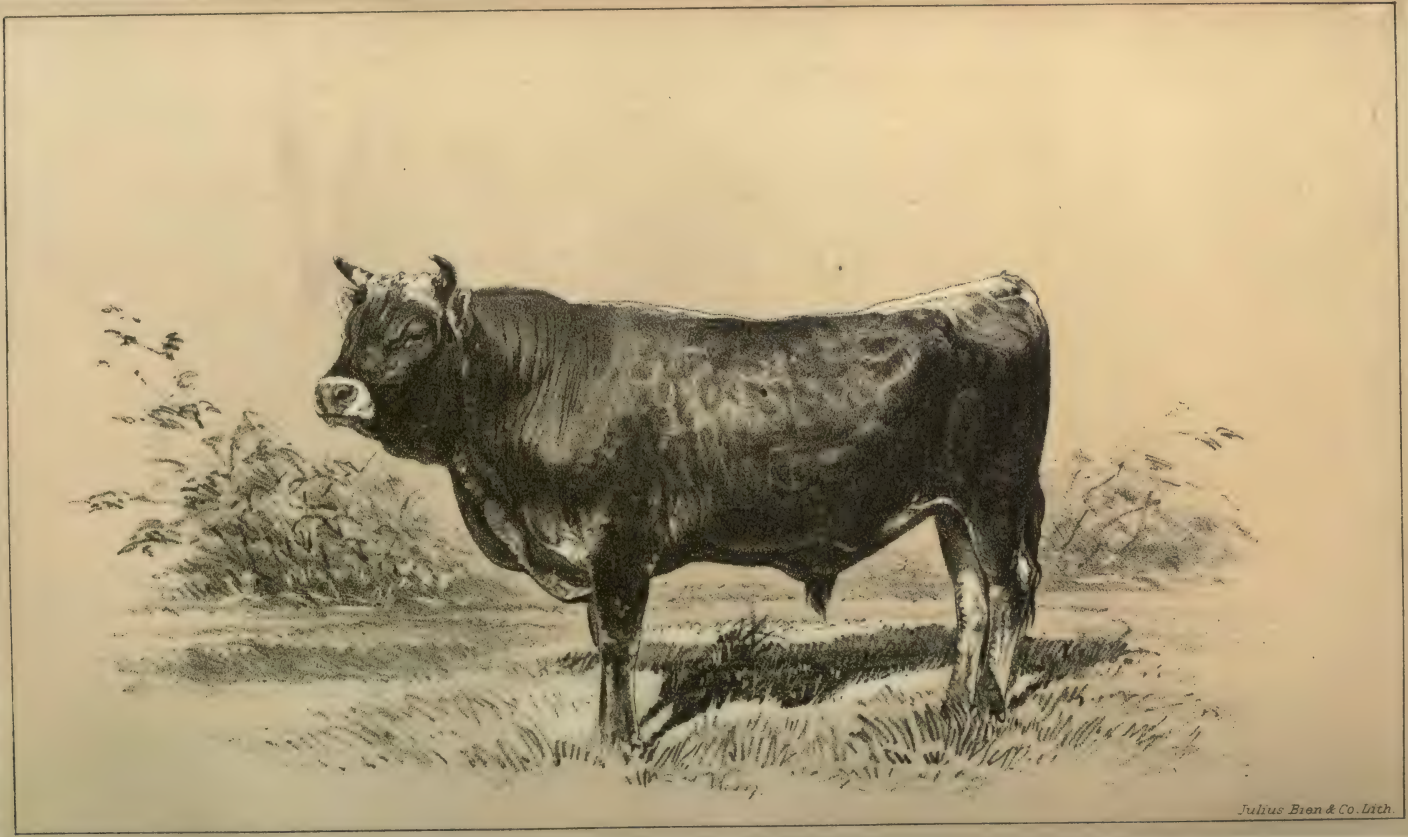
PLATE 37



Julius Bien & Co. Lith.

WELSH COW

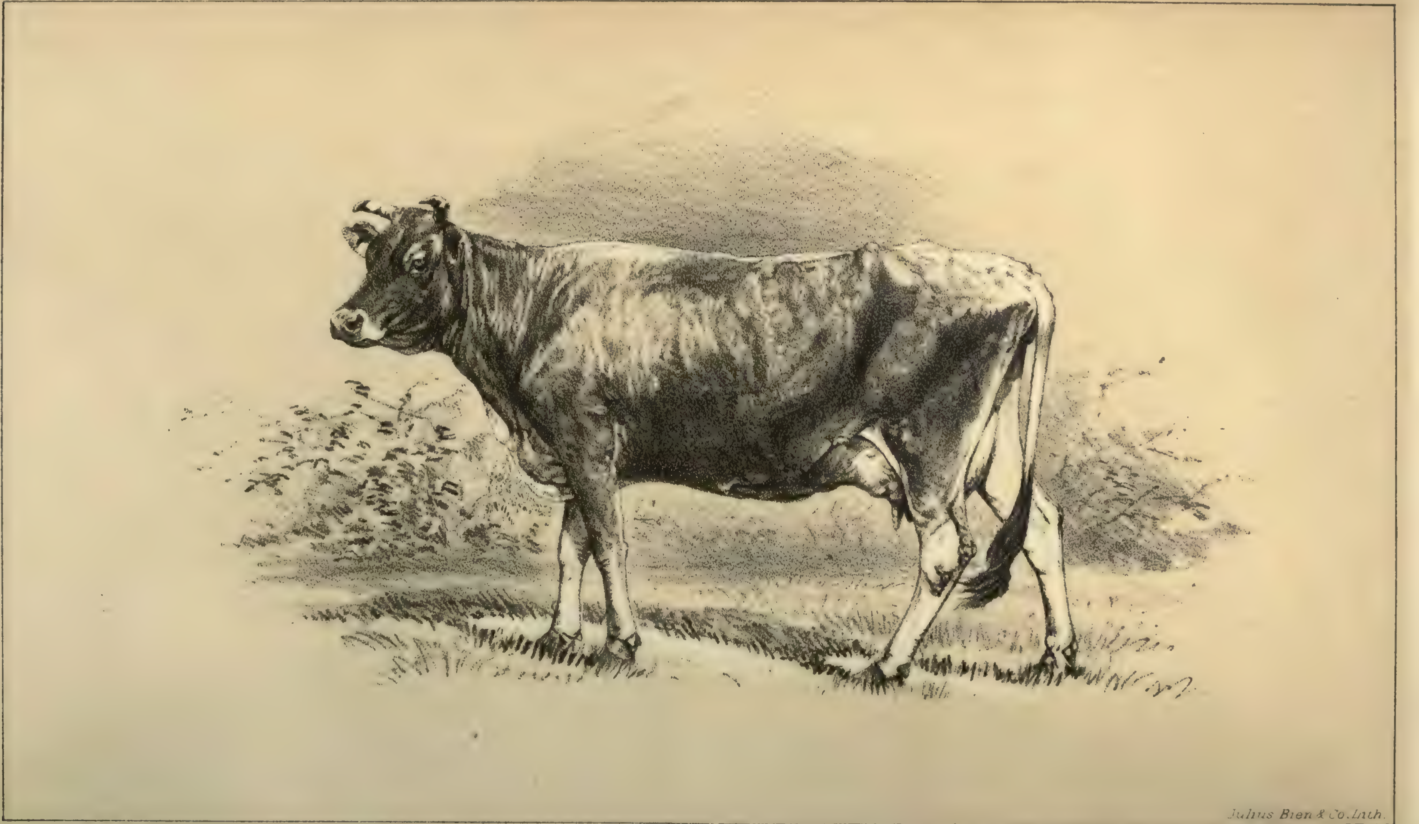
OWNED BY MAJ HENRY PLATT BANGOR


Julius Bien & Co. Lith.

JERSEY BULL

OWNED BY E. J. ARNOLD, SUMMERLAND HOUSE, JERSEY.

PLATE 39



Julius Bien & Co. Lith.

JERSEY COW

OWNED BY E. J. ARNOLD, SUMMERLAND HOUSE, JERSEY.

small island, which is only 12 miles long by 6 miles broad, and, what is most remarkable, it exports every year above 2,000 head of cattle.

The Jersey cow is specially adapted for the dairy, yielding a quality of milk so rich that no other can be compared to it. But the specialty is butter, and in this it stands unrivaled for quality and profit.

Description.—The head should be small, slender, and lengthy from the eye to nose; the horns thin and open, not cramped or too curly; the eye full but not too prominent; the ear lengthy and broad and well fringed with hair; a broad muzzle should be avoided; the neck should be long, flat, and narrow, with a tendency to rise at the withers, and breadth behind the arm to allow of a full expansion of the lungs, the chest being rather deep than broad. The flat-sided cow is more especially to be chosen as a milker; the hips should be wide, rugged, and high, and the haunches wide and large, drooping toward the tail; the thigh long and lean from hip to hock, the veins being prominent and easily felt; the legs slender with flat bone and small, flat feet, the hinder ones having good width between, to afford room for the udder; a long and thin tail is a great point in breeding.

This is a general description of the breed, but the Jersey Agricultural Society have a standard of points by which they judge an animal.

Color.—They are gray-fawn and white, yellow-fawn and white, gray-dun and white, gray and white, silver-gray dun, cream-color fawn, &c.

Animals.	Average weight at maturity.
Cow .... cwt..	8
Bull .... do...	12
Ox	Rare.

Age at maturity: Four to five years.
How long bred pure: Five hundred years.
Annual average pounds of milk: Seven thousand.
Milk to pounds of butter: Twenty pounds to 1 pound butter.
Milk to pounds of cheese: None made.

Product.	Quantity.
Meat .... pounds..	750
Milk .... do....	7,000
Cheese	None.

Labor: Little or none.
Method of housing: Housed at night and tethered by day.
Feeding: Grass, turnips, &c.
Breeding: Commence at about sixteen months.
Grasses: Trefoil, Lucerne, clover, rye.

The following are some of the famous yields of Jerseys as published by Mr. E. P. Fowler, of Southampton:

Yield of butter per week when in full flow.

Number.	Quantity.	Number.	Quantity.
	Lbs. oz.		*Lbs. oz.*
1	28 0	8	18 0
2	20 13	9	17 9
3	20 0	10	17 0
4	19 8	11	16 12
5	19 0	12	16 0
6	18 12	13	15 12
7	18 4	14	14 0

Cream test, 32 degrees.

Decrease of stock.—Rinderpest or foot and mouth disease has never appeared in the island. The decrease is owing to the great number exported of late years to America, where the breed is highly prized.

Price.—From $200 to some thousands, according to pedigree.

Topography.—The surface of the island is everywhere undulating. The high land consists, for the most part, of granite rocks; the southern part, of a mass of schistose rocks incumbent upon granite.

Temperature.—The climate of Jersey from its insular situation is milder than that of other places under the same latitude, and the mean temperature, which is 53°, is higher than that of any part of England. In summer it is 61°, and in winter 42°.

AYRSHIRE CATTLE.

This breed is found in Ayrshire, Scotland (whence it derives its name), and the adjacent portion of the Lowlands. It is an admirable breed of milch cattle, rather under the middle size, but hardy, and yielding excellent milk in large quantities.

Description and color.—The improved cow has the head small, but rather long and narrow at the nozzle, though the space between the roots of the horns is considerable; the horns are small and crooked; the eye is clear and lively; the neck long and slender and almost destitute of a dewlap; the shoulders are thin and the forequarters generally light; the back is straight and broad behind, especially across the hips, which are roomy; the tail is long and thin; the carcass is deep; the udder capacious and square; the milk vein large and prominent; the limbs are small and short, but well knit; the thighs are thin; the skin is rather thin, but loose and soft and covered with short hair; the general figure, though small, is well proportioned; the prevailing color is mottled red and white.

Product.	Weight.
Annual average production of milk .... pounds..	9,000
Milk to pounds of butter .... do....	35
Milk to pounds of cheese .... do....	16
Average weight at maturity:	
Cow .... cwt..	12
Bull .... do....	16
Ox .... do....	18

Age at maturity: Four to five years.
How long bred pure: One hundred years.

Product.—A good cow will yield from 9,000 to 10,000 pounds milk. This milk is calculated to return about 250 pounds butter or 500 pounds cheese per year.

Treatment.—The cows are treated by enterprising farmers as follows: They are kept constantly in the byre (or shed) till the grass has risen to afford them a full bite. Many put them out every good day through the winter and spring, but they poach the ground with their feet and rip up the young grass as it begins to spring, which, as they have not a full meal, injures the cattle. Whenever the weather becomes dry and hot the cows are fed on cut grass in the byre from 6 in the morning to 6 in the evening and turned out to pasture the other hours; when rain comes the house feeding is discontinued; when pasture grass begins to fail in harvest they receive a supply of the second growth of clover, and afterwards of turnips strewed over the pasture ground; when the weather becomes stormy in the fall of the year the cows are kept in the byre during the night, and in a short time afterwards both night and day; they are then fed on oat straw and turnips; they continue to yield a considerable quantity of milk for some time; part of the turnip crop is eaten at the end of harvest and beginning of winter to protract the milk, and part is stored up for green food during the winter; after this store is exhausted the "Swedish" turnip and potatoes are used along with any fodder till the grass can support the cows. Chaff, oats, and potatoes are boiled for the cows after calving, and they are generally fed on rye grass during the latter part of the spring.

Price.—The average price for good cows is from $122 to $146.

The county of Ayrshire is for the most part plain open country, neither hilly nor level, but rising from the shore in a gradual easy acclivity till it terminates in mountains on the southeast, and moorish hills on eastern boundaries. No part can be termed level, for the surface abounds with numerous swells and roundish hills which facilitate the escape of moisture and promote ventilation.

Climate.—For more than two-thirds of the year the wind blows from the southwest, and the rains are often copious and sometimes of long duration. The temperature is 59° in summer, 37° in winter, and the mean during the year 47°.

Soils.—Clay, or argillaceous earth, is the most common. This species is so tenacious that it can only be plowed in a state of moisture, but by application of lime and other manure it is convertible into fine rich loam, thousands of acres having been thus treated. Loam of alluvial formation is found in holms on the sides of rivers and other low situations. The substratum in the higher parts of the county abound in unmixed granite, while also is found breccia whins-tone, greenstone, and red sandstone.

EXPORTATION OF BRITISH CATTLE TO THE UNITED STATES.

All of the breeds here treated are said to have greatly improved in the United States, where the conditions of climate and soil have been favorable.

The best animals to import are the pure breeds, and choice should be made according to the needs and fancy of the importer and the circumstances of the climate, &c., of his grazing lands.

For dairy purposes, having regard to cost of keeping, the preference seems to be for the Alderney, Ayrshire, and Welsh, while the Shorthorn and Red-Polled excel both for milk and beef-producing qualities. As a general farm stock the Devon, Hereford, Polled, Aberdeen or Angus, and Sussex are pre-eminently admired for beauty, size, and flesh-making qualities.

As to the best methods, best routes, and cost of transportation, Mr. De la Perrelle writes as follows:

> The loss through mortality, an important item, I have found can be overcome by profiting by the experience of practical shippers. My experience, which has extended over many years, has proved that personal and practical attention is amply repaid from the fact that the loss of cattle shipped by me has not exceeded 1 per cent. Many shippers find, therefore, difficulty to obtain marine insurance, and the rates rule high from the fact of their not attending and insisting upon the details of properly stalling cattle on board steamers, cheapness in this particular being false economy.
>
> As to the route, some are shipped from London, Southampton, Bristol Channel, Liverpool, and Glasgow, but I would give the preference to Liverpool, as I consider it offers greater facilities for shipping than any other port. The freight per head is from $25 to $35, according to destination, but I ship sometimes at a much lower rate when there is a large number of animals to ship, and I reckon the cost of food *en route* for pedigree stock to be about 36 cents per day.

WHERE TO PURCHASE BRITISH CATTLE.

The following may be of interest to intending purchasers as showing the places and dates where most of the animals of the reported breeds may be seen and purchased:

West Highland and Scotch cattle generally are shown in large numbers at Falkirk trysts (or fairs) second Monday in September and October, when from 20,000 to 30,000 are shown; at Muir of Ord fairs, Inverness, and all Scotch fairs; also at Newcastle October fairs; at Stagshaw, in the same county; at Brough Hill, Westmoreland; at the Norwich markets, and at Barnet fair on the first week in September, and Worthampton August 26.

Galloways are met with at all the fairs in south and west of Scotland; at Carlisle, Penrith, Rosley Hill on Whit Monday, Brough Hill, and Newcastle fairs.

Shorthorns: The fairs at Newcastle-on-Tyne, Durham, Darlington, Yarm in Yorkshire (October 19 and 20), Northallerton, Northampton, Boston in Lincolnshire, Stow-on-the-Wold, Gloucestershire are remarkable in their several districts for this breed. Of these Newcastle, Darlington, and Yarm are probably the best.

Herefords: The best shows of this stock are at the fairs in Herefordshire in the month of October at the great market in Hereford itself, October 20; at Leominster in March and October 27; at the fairs in Monmouth and in Ross great numbers of well-bred animals are shown. Among the other fairs those of Shrewsbury, Wolverhampton, Birmingham, Gloucester, and Barnet in Hertfordshire, are noteworthy.

Devons are shown in their own county at South Molton, Saturday after February 13; Crediton, Saturday before last Wednesday in April; Sampford-Peveril, the following Monday; Exeter, February 10, May 19, July 21, December 8; North Molton, third Wednesday in May and last Wednesday in October; at Barnet fair, first week in September; Boughton Green, Northampton, June 24, 25, and 26.

Sussex cattle are rarely met with out of their own county and its neighborhood (Lewis, May 6).

Channel Islands: One of the best fairs for this stock (Jerseys) is Southampton, Trinity Monday.

Ayrshires are met with in abundance at the fairs in the southwestern counties of Scotland, the principal probably being Ayr (last Friday in April) for cows, barren and in calf, and young cattle.

I have the honor to transmit herewith tabulated summary of the special points of information called for by the Department's form sent me.

STEPHEN B. PACKARD,
Consul.

UNITED STATES CONSULATE,
Liverpool, January 28, 1885.

Tabulated summary of the special breeds of British cattle reported by Consul Packard.

Name of breed.	Annual average pounds of milk.	Milk to pounds of butter.	Milk to pounds of cheese.	Great Britain.	Live weight.			Age at maturity.
				Habitat.	Cow.	Bull.	Ox.	
					Cwt.	*Cwt.*	*Cwt.*	*Years.*
Shorthorn	11, 500	40	....	Yorkshire, &c	16 to 18	18 to 20	20 to 22	3
Devon	6, 000	....	....	Devonshire	9	12	11	(*)
Sussex	3, 000	....	....	Sussex, &c	14 to 17	15 to 20	17 to 20	2 to 4
Hereford	9, 500	30	....	Hereford, &c	12 to 14	16 to 20	20 to 22	3
Red Polled	11, 250	35	....	Norfolk and Suffolk	12	16	14	4
Angus or Aberdeen	9, 000	27	....	Forfar and Aberdeen	14	18	15 to 16	3
Welsh	4, 000	13	....	North Wales	13 to 14	15 to 18	13 to 15	3½
Jersey	7, 000	20	....	Isle of Jersey	8	12	Rare.	4 to 5
Ayrshire	9, 000	35	16	Ayrshire	12	16	18	4 to 5

*Steers, 4 years; cows for breeding purposes, 4 to 6 years.

Name of breed.	Color.	How long bred pure.	Product.			
			Labor.	Meat.	Milk.	Cheese.
				Lbs.	*Lbs.*	*Lbs.*
Shorthorn	Roan, white, red and white, red.	Since 1780	Little.	⅔ds of gross weight.	11, 500	....
Devon	Red	Since 1827	..do	1, 232	6, 000	350 to 500
Sussex	....do	....	....	....	3, 000	....
Hereford	Red and white	From a remote period.	Little.	1, 770	9, 500	....
Red Polled	Red	One hundred years.	..do	1, 072	11, 250	336
Angus or Aberdeen	Black	From a remote period.	..do	1, 456	9, 000	....
Welsh	Black, and occasionally dun and red.	....	....	....	4, 000	....
Jersey	Gray, fawn, and white, and various.	Five hundred years.	Little.	750	7, 000	....
Ayrshire	Mottled red and white.	One hundred years.	....	....	9, 000	500

District.	Mean temperature.	Summer.	Winter.	Soil.			
				Alluvial.	Loam.	Clay.	Sandy, &c.
	°	°	°				
Yorkshire	49	62	37	....	Loam	....	
Devonshire	51	60	39	....	Clayey loam.	Yellow and white clay.	
Sussex	50	63	38	....	Stiff loam to sterile sand.		
Herefordshire	49	60	39	....	....	Clay to light sand.	
Norfolk and Suffolk	49	62	37	Alluvial.	Loam	Clay	
Forfarshire and Aberdeenshire.	45	57	36	....	....	..do	Sand and various.
North Wales	50	59	42	....	....	....	Sandy loam, &c.
Jersey	53	61	42	....	....	....	
Ayrshire	47	59	37	Alluvial.	....	Clay	

Tabulated summary of the special breeds of British cattle, &c.—Continued.

District.	Limestone.	Sandstone.	Granite.	Clay.	Gravel, &c.	Cultivated grasses.	
						Clover.	Rye, grass, &c.
Yorkshire		Old red sandstone.		Clay	Gravel	Clover	Rye.
Devonshire		do				do	Rye, &c.
Sussex	Lower greensand, chalk, and lower Eocene rocks.						
Herefordshire	Limestone			Clay	Gravel	Clover	Do.
Norfolk and Suffolk						do	Do.
North Wales	Limestone	Sandstone	Granite.				
Jersey			Granite, &c.			Clover	Rye, trefoil, and lucern.
Ayrshire		Old red sandstone.					

District.	Method of housing.	Feeding.	Breeding.
Yorkshire	Young stock are housed from November to March. Fat and milch cows are housed at night from October to May.	Fed in the morning with hay, roots, and oil-cake, and Indian meal, then turned into pastures.	At 2½ years.
Devonshire	In pasture	Grass, turnips, and oil-cake	At 2 years.
Herefordshire	Open yards during winter, with a run out by day. Summer, out in rough pasture.	Hay, straw, roots in winter, pastures in summer.	At 2½ years.
Norfolk and Suffolk	In pasture	Grass, carrots, beet-root, turnips, and cake.	At 2 years.
Forfarshire and Aberdeenshire.	In covered courts. Stalled in winter. Pastures in summer.	Grasses turnips, straw, and cake.	Do.
Jersey	Housed at night and tethered by day.	Grass, turnips, &c	At 16 months.
Ayrshire	(See report.)		

HEREFORD CATTLE.

REPORT OF CONSUL LATHROP, OF BRISTOL.

I have the honor to inclose a report on Hereford cattle in answer to Department circular of the 18th of July, 1883.

This consulate has in its immediate vicinity three breeds of cattle, viz, Devons, a fine tribe of Short-horns, and Herefords.

I have selected the latter breed as the subject of my report, to the exclusion of the other two, for the following reasons: (1) On account of the wide celebrity already enjoyed by these two breeds, making a report unnecessary; and (2) on account of the fact that the Hereford seems to be, of all breeds in the United Kingdom, the one most suited to the needs of the stock of the United States.

While much of what I have written is undoubtedly familiar to our breeders, yet I trust that this report may contribute somewhat towards diffusing widely a knowledge of the great merits of this sterling breed.

Hereford cattle in the herd are a peculiarly impressive sight. Their grand development, their firm agility and light activity, their intelligent faces and placid expression, and possibly more than anything else their wonderful similarity to each other, all combine to make a spectacle pleasing to even the most indifferent observer. He cannot fail to note how closely they conform to a common type, and that type a striking one. Its main feature is suggested when I say that they are oftener spoken of as "white faces," or "red-with-white faces" than as Herefords. But Hereford cattle have not always thus assimilated so closely to a common type. Up to well within the present century there were four distinct varieties of the breed differing widely from one another in appearance, but three have succumbed so completely to the "red-with-white" face that a Hereford not thus marked is as rare as a white crow.

The origin of the breed is doubtful. The best authorities consider it aboriginal; others claim its importation from Normandy or Flanders; others, again, think the climate and conditions of Hereford County have made what they have out of an animal that originally inhabited the shire of Devon. Be its origin what it may, its environment in Hereford County and surrounding counties has resulted in one of the finest beef-producing breeds of cattle in the world, nor is the breed to be despised for the dairy under conditions more favorable than are to be obtained in its home county.

The authentic history of the breed begins about the year 1800. In the year before this occurred the first cattle show of the celebrated Smithfield Club, and a Hereford ox was the winner of the first prize; a more general acknowledgment of merit then than now, because at that time, and indeed up to the year 1851, all breeds were shown in competition with each other. This ox was 6 feet 7 inches high, 10 feet 4 inches girth, and weighed 1,976 pounds (live weight). His success was maintained by the breed so well that up to 1851 the Herefords are credited in Smithfield Club records with one hundred and eighty-five prizes for their oxen and steers against one hundred and ninety for all other breeds together, including Shorthorns, Devons, and Scotch. The record of prizes won by Hereford cows and heifers is, however, by no means so good, being twenty-two for them against one hundred and eleven for all other breeds. Mr. Duckham, in his interesting and valuable little work on the breed, comments thus on this disparity between the success of the males and females. He says:

> This is certainly a great falling off compared with the oxen and steers, and goes far to prove the correctness of my remark respecting the study of nature's laws in the cultivation of the soil and of the adaptation of stock to it. The soil of the county of Hereford being neither applicable for dairy or feeding purposes, those who have cultivated it for ages made it their study to breed steers and oxen which should, by their superior quality and aptitude to fatten, command the attention of the distant grazier.

Herefordshire has 550,000 acres. About 100,000 acres are utilized neither for pasture nor agriculture; the balance is divided equally, almost, between these two pursuits. The substratum is a light-red sandstone, and the soil generally is a deep-red heavy loam, sometimes with some clay in it. The surface of the county is hilly, and averages about 250 feet above sea-level. There are some small but beautiful and fertile valleys. The culture of tree-fruits, notably apples, and of hops is largely pursued. Damp fogs prevail at some seasons and help to keep the grass beautifully green all the year round.

Mr. Southall has kindly furnished me with the following particulars of temperature, rainfall, &c., the results of his own observations at his house in Ross, the sourthern part of the county:

Temperature.	1882.	1883.
	° ′	° ′
Absolute maximum	84. 1	*77. 0
Absolute minimum	19. 6	†18. 8
Average maximum	57. 1	56. 9
Average minimum	42. 3	41. 6
Mean	49. 7	49. 25

* The temperature reached this extremely moderate height only on three or four days in the year.

† On one day only.

The rainfall amounted in 1883 to 31.52 inches, being 1.34 inches more than the average. There were in this year 197 days on which rain fell.

The ideal Hereford is thus described by Mr. Duckham:

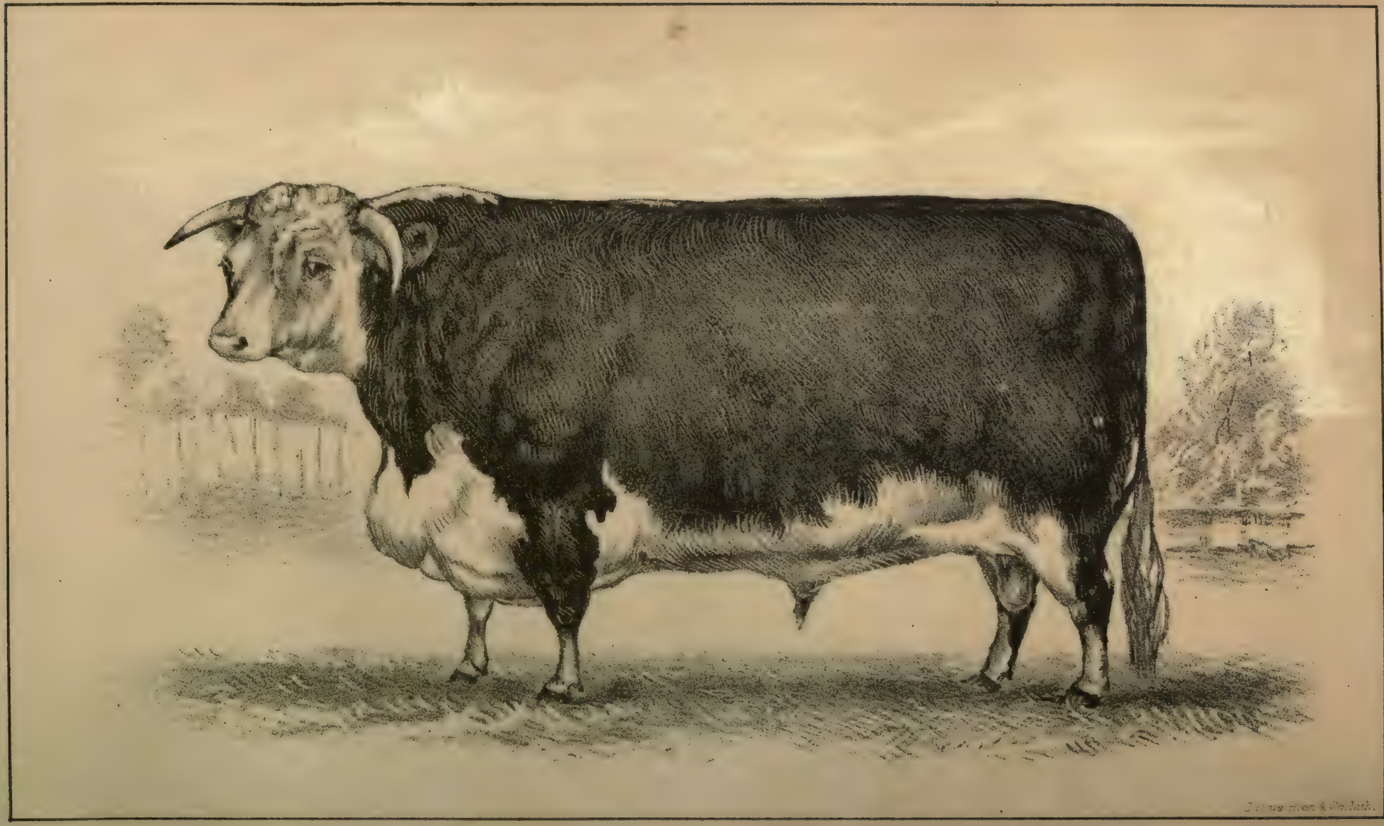
> The face, throat, chest, lower part of the body and legs, together with the crest or mane, and the tip of the tail, a beautifully clear white; a small red spot on the eye, and a round red spot on the throat, in the middle of the white, are distinctive marks which have many admirers. The horns are of a yellow or white waxy appearance, frequently darker at the ends; those of the bull should spring out straightly from a broad flat forehead, whilst those of the cows have a wave and a slight upward tendency. The countenance is at once pleasant, cheerful, and open, presenting a placid appearance, denoting a good temper and that quietude of disposition which is so essential to the successful grazing of all ruminating animals; yet the eye is full and lively, the head small in comparison to the substance of the body. The muzzle white, and moderately fine thin cheek. The chest deep and full, well covered on the outside with mellow flesh; kernel full up from shoulder-point to throat; and so beautifully do the shoulder-blades blend into the body that it is difficult to tell in a well-fed animal where they are set on. The chine and loin broad; hips long and moderately broad; legs straight and small. The rump forming a straight line with the back, and at a right angle with the thigh, which should be full of flesh down to the hocks, without exuberance; twist good, well filled up with flesh even with the thigh. The ribs should spring well and deep, level with shoulder-point; the flank full, and the whole carcass welland evenly covered with a rich mellow flesh, distinguishable by yielding with a its pleasing elasticity to the touch. The hide thick, yet mellow, and well covered with soft, glossy hair having a tendency to curl.

A glance at the cuts presented here will show us immediately how closely the animals whose portraits have been selected to accompany this article answer to this description. The bull, Romeo, is perfect. He was bred by Mr. Carwardine, of Leominster, in Herefordshire, and was sold in 1882 to Messrs. Earl & Stuart, of Lafayette, Ind., where he now is.

The ox pictured here was bred by Mr. J. Price, of Pembridge in Herefordshire. He won the Elkington Challenge Cup at Birmingham in 1881, and again in 1882. This prize has never before been won twice by the same animal, and, in recognition of his great feat, the portrait of this ox is to have the place of honor, the title-page, of volume 14 of the Hereford Herd-Book, just about to be issued. The general rule is to admit to the herd-book only cuts of such animals as take first prize at a royal agricultural show. The thirteenth volume, I may mention here, contains the names of 199 breeders, of whom 11 are either in the United States or Canada. The fourteenth volume, which is to be issued in February next, contains, I am informed, a much larger number of breeders' names. I hardly think it necessary, but still I venture to suggest that no American owner or breeder of Herefords eligible for entry should omit to register them. The herd-book is under the control of S. W. Urwick, esq., of Leominster, and all breeders of these cattle are under obligation to him for the accuracy and completeness of the work. I take pleasure in acknowledging here the obligation I also am under to Mr. Urwick for assistance rendered and information extended in connection with this report.

The two cows portrayed here are both royal prize winners at late shows. Golden Treasure has a little too much white for a perfect Hereford, but in other respects she is all that a pure-bred Hereford should be.

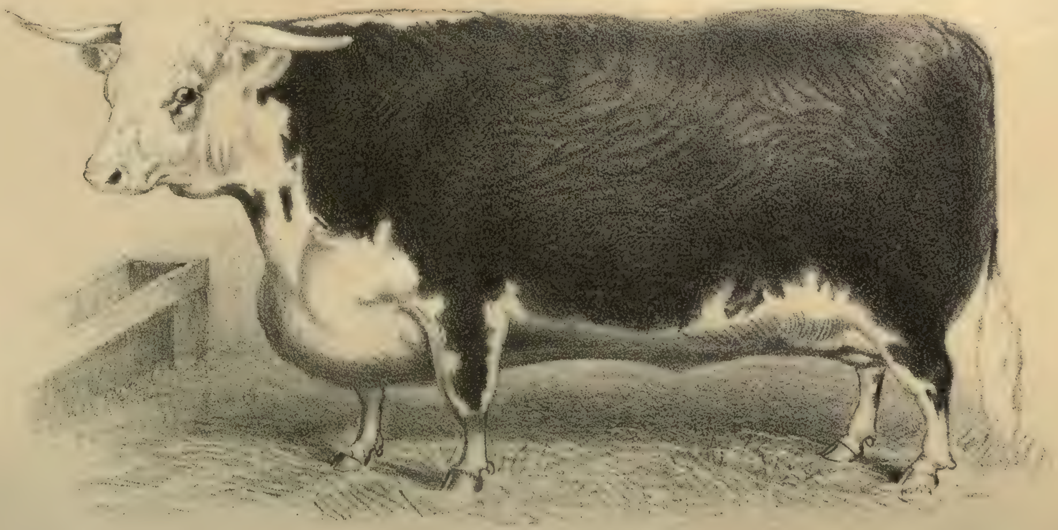
Herefords were formerly used considerably in the yoke, where "they combined the activity of the Devon with the strength of the Shorthorn." There, as well as in grazing, their placed, quiet temper rendered them doubly valuable. In these old days when they were put to the yoke, when the demand for meat was not so pressing as now, nor money requiring so rapid a turn-over, they were often kept until six or seven



Julius Bien & Co. lith.

"ROMEO"

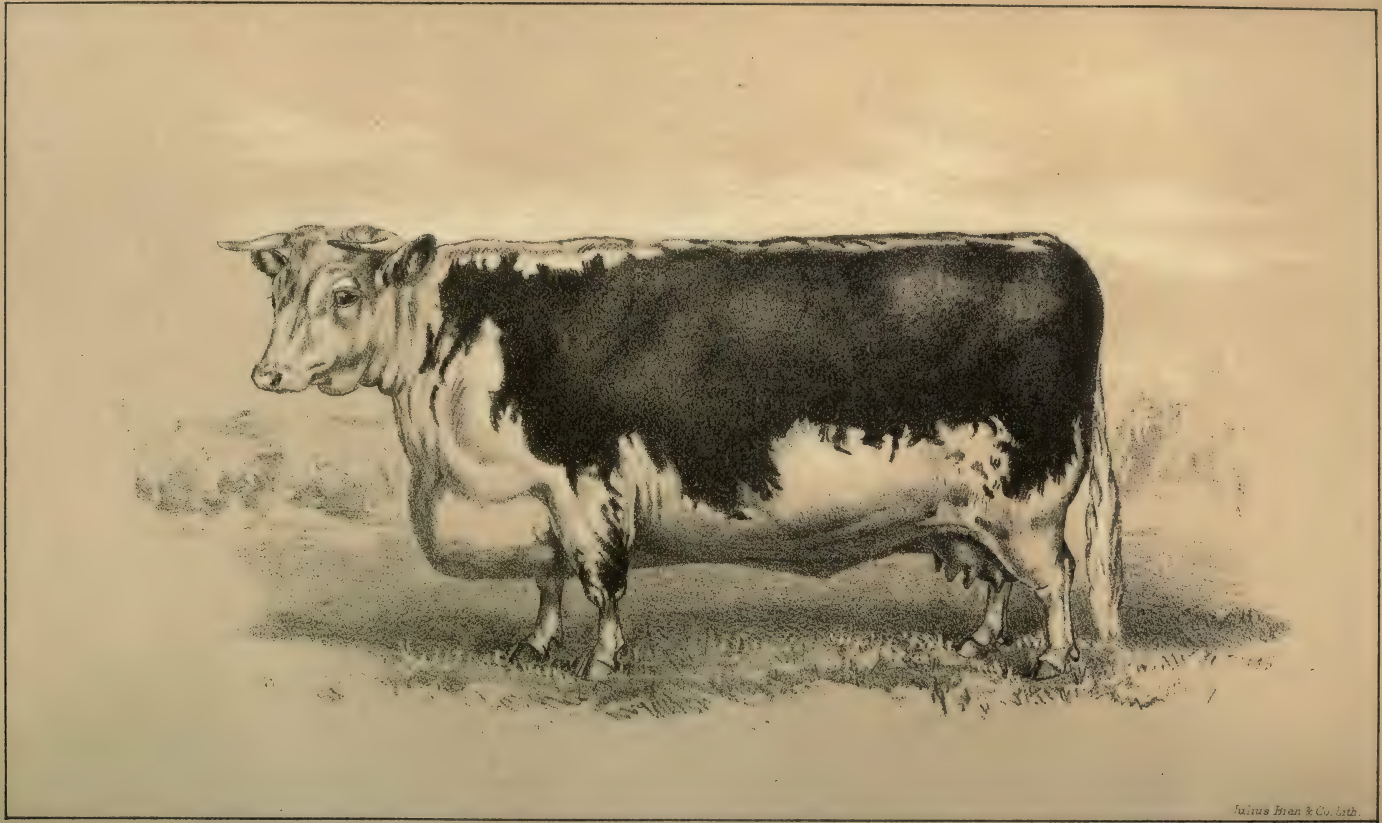
AT 18 MONTHS OLD, IMPORTED 1882. BRED BY AND THE PROPERTY OF EARL & STURAT, LAFAYETTE INDIANA.
BRED BY T. J. CARWARDINE, LEOMINSTER, ENGLAND.



Julius Bien & Co. Lith.

"HEREFORD OX," AT 3 YEARS 8 MONTHS OLD

WINNER OF FIRST & CHAMPION PRIZES AND ELKINGTON CHALLENGE CUP TWO YEARS IN SUCCESSION
AT BIRMINGHAM 1881-2. BRED BY MR. J. PRICE, COURTHOUSE, PEMBRIDGE



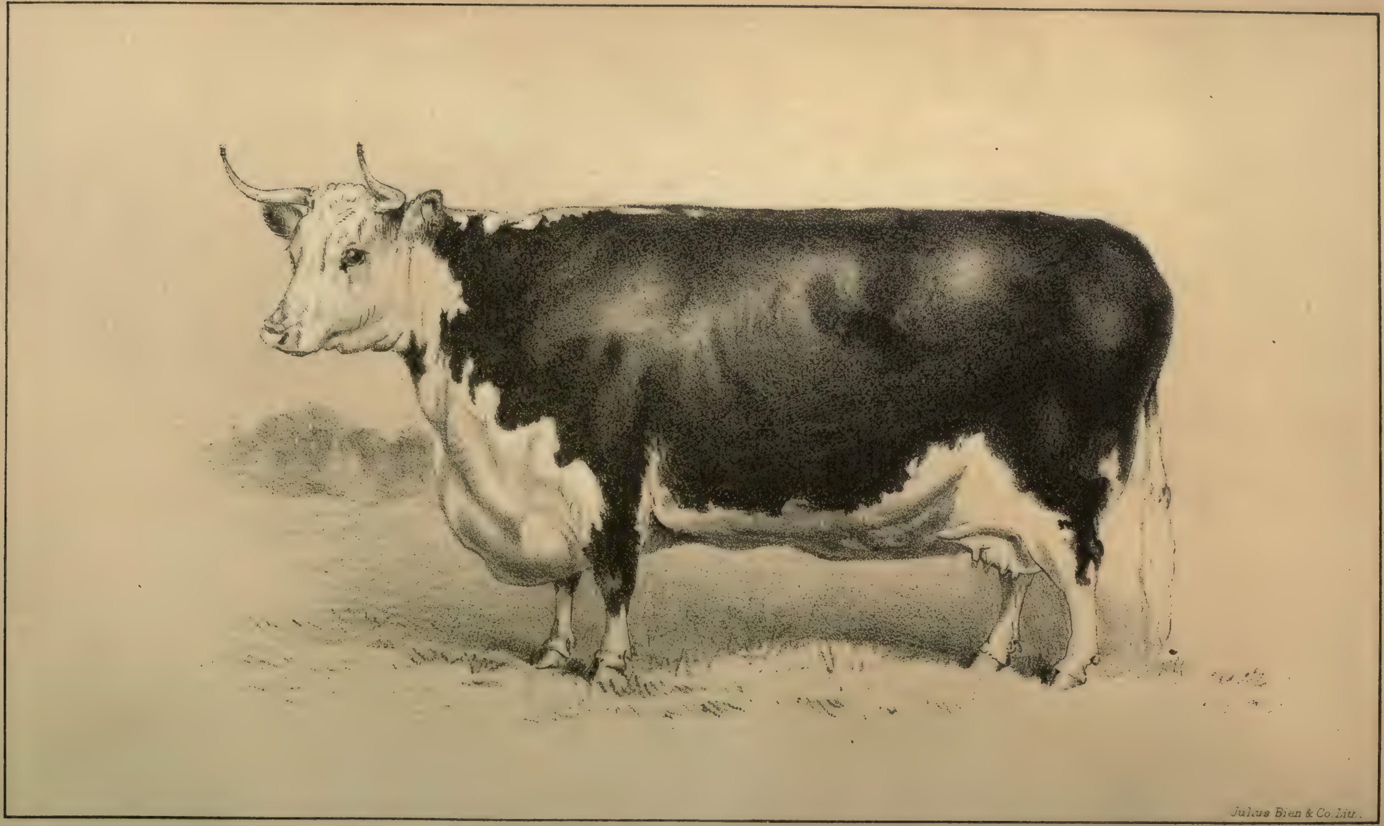
Julius Bien & Co. Lith.

"GOLDEN TREASURE," AT 5 YEARS 2 MONTHS OLD

BRED BY AND THE PROPERTY OF THE EARL OF COVENTRY

CROOME COURT WORCESTER

PLATE 43



Julius Bien & Co. Lith.

"GIANTESS," AT 11 YEARS OLD

THE PROPERTY OF THE EARL OF COVENTRY, CROOME COURT WORCESTER,
BRED BY THE LATE MR W TUDGE ADFORTON LEINTWARDINE

years old; and their flesh developed "that beautiful marbled appearance caused by the admixture of fat and lean which is so much prized by epicures." Such finely ripened beef is no longer procurable, as the Hereford is now considered ready for the market at from 20 to 30 months old. Grass with a little oil-cake is all they need, and their agility in grazing and facility for fattening makes the steers much sought after to graze in the midland counties for the London market. They are in their prime at three, but will grow up to four, and their live weight at maturity is from 1,800 to 2,500 pounds. The calves are dropped generally from April to July. Yearling heifers are seldom put to the bull. The calves run on their dams for 6 or 7 months, and are rarely weaned on oil-cake. The young steers are fed upon grass, and get turnips and cut straw and sometimes a little oil-cake in winter.

I subjoin to this report a table showing the live weights of all the cattle of all breeds exhibited at the eighty-sixth annual show of the Smithfield Club in December, 1883, prepared by me from the official catalogue. It is presented more as a matter of interest than for any deductions that might be drawn from it. "The youngest and oldest Hereford classes as a general thing at these shows," Mr. Duckham writes me, "are the heaviest of any exhibited." The superiority in weight of the younger classes proves, of course, their earlier development; the superiority of the oldest, indicates that eventually they attain a greater size than other breeds. But I have already said that Herefords are not commonly allowed, for various reasons, to obtain the age which in the past made them so remarkable for their size and weight.

Another reason for the lack of "tall figures" in these days for cattle weights is the partial abandonment of the time-honored practice of feeding up stock until it becomes so fat as to be literally useless for any other purpose than to take a prize.

Mr. McDonald, in his report to the Royal Agricultural Society upon the stock exhibited at the society's meeting at York in July, 1883, says on this point:

> Overfeeding has been disappearing somewhat in recent years. There is still too much of it, however.

He says elsewhere:

> Preparation for modern show yards is a severe ordeal and only good constituted animals can endure it. It leads to many breeding mishaps and failures; but when one finds the sires and dams of so many of the prize-winners themselves in prize-lists, as was the case at York, one is forced to the conclusion that successful showing and breeding go hand in hand to a considerable extent and to a larger degree than is commonly imagined; and one is led to believe that high feeding is not so detrimental in skillful hands to successful breeding as is generally imagined.

Herefords, and only Herefords, are found in Herefordshire, Shropshire, Monmouthshire, Radnorshire, Breconshire, and also in Worcestershire and Montgomeryshire. Large numbers are also found in Cornwall and Ireland, and there are herds of them in many other counties. They are seldom crossed with the Short-horn, though they are said to blend well when it is done; the same statement holds good with the Ayrshires. Hereford on Devon has been tried, resulting in a progeny inferior in some respects. Hereford on Alderney is said to produce satisfactory results, improving the cow of the first cross as a feeder and not injuring her milk in quantity or quality. A cross with the West Highland Kyloe was a failure, but with Galloway Polls was a great success. These statements of the results of Hereford crosses are taken from a prize essay for the Royal Agricultural Society made by the late H. H. Dixon, a notable authority on such matters when alive.

Evidence establishes beyond question that the Hereford when removed to almost any climate does not degenerate as a beef producer. The females, too, of the breed are found most satisfactory for the dairy, under different conditions than can be found in their home countries. Both of these conclusions are contrary to an opinion I have heard many express to the effect that Herefords deteriorate away from home. But I have observed that while such an opinion seems very general, it is maintained by those without special knowledge of the breed, and I think it an inherited prejudice which a little investigation would disprove to the satisfaction of the holder. "Old prejudices die hard" is true and trite. In Bedfordshire and Dorset herds have been maintained for many years, fifty in some cases, and these herds are fully up to the standard of the homebred ones; in every case, that is, in which due care has been taken to get an occasional infusion of fresh blood. In the wet and changeable climate of Cornwall the breed is established largely and maintains its reputation, though Devons and Short-horns are said to deteriorate there. In the counties near London, Surrey, Cambridge, and Kent, Herefords have done well; also in Wales and Scotland. They withstand the severe climate of the latter country without seeming difficulty, and will live where many Short-horns cannot. In Ireland they are much esteemed and their number is constantly in creasing. They maintain in all these places their characteristics of early development and rapid and even fattening.

The breed seems to stand the heat with the same indifference it does the cold. In Jamaica the progeny of some imported Hereford bulls have proved the most valuable and useful stock in the island; and the heat of Australia has not affected in the slightest degree the characteristics of the large number of Herefords there. Of their success in the United States I shall speak farther on.

I have thus far considered the Herefords mainly as a butcher's breed. I will now speak of their qualifications for the dairy. In the shire of Dorset, one of the crack dairy districts of England, producing a butter much sought after,* there are many Hereford dairy herds. The owner of the largest of these herds wrote twenty years since as follows:

> Our herd of Herefords have been established nearly thirty years, and so far from their being degenerated with us they are much improved, and Hereford dairies are becoming very common in this county. In proof that they are good for milk with us, we let nearly 100 cows to dairy people, and if I buy one of any other breed to fill up the dairy, they always grumble, and would rather have one of our own bred heifers. Our system is, we let our cows at so much per year, finding them in land and making the hay; the calves being reared by hand with skim milk and linseed until three months old, when we take them, and allow a quarter's rent of the cow for the calf at that age; they are then turned into the pasture.

The proprietor of this herd and writer of this letter was Mr. James, of Blandford, Dorset. His son writes me under date January 19, 1884, that the same system is still pursued and that the Herefords are as great a success as ever. He says:

> My late father and myself have kept and bred Herefords for dairy cows for forty-eight years and have always used the best blood we could get. I have won a number of prizes for "dairy cows" and "dairy cows and offspring" against Devons and Short-horns.

Mr. James further says:

> In a cold, wet, sour place there is nothing like the Herefords; their good coats are a protection in the winter. The butter that is made is a splendid color and taste.

---

* So much appreciated is this Dorset butter, that to my personal knowledge it is a common practice for retailers in Bristol to call certain fine grades of Normandy butter Dorset butter. They say it is about the same and helps the sale.

> There are lots of Hereford dairies in this county. In the year 1881 I sold two bulls to cross Short-horns, and I know parties who have crossed Herefords with Short-horns and have come back again to the Herefords.

Mr. White writes me from Wiltshire as follows:

> I keep a dairy of ninety pure bred Hereford cows, which breed has been kept on this farm for the last sixty years, and I have at all times endeavored to obtain the milkiest strain I could, and I think I have now a herd of cows more adapted to dairy purposes than any other Hereford herd in this country. I have made fair trials between the Hereford and Short-horn as to profit, and I give my decided preference to the former.

The testimony from these two herds is the most valuable that could possibly be obtained as to the dairy capabilities of the breed, as they are the largest, and have been longest established of any in existence. I have received letters similar in tenor to the above from various smaller breeders in different counties, and I have not been able to discover an instance where breeders or dairymen have changed back to other breeds after starting in with Herefords. I had hoped to send with this report some figures giving actual milk and butter products, &c., but I must leave them for a supplementary report, as I have already detained this one over a month, waiting for the promised statistics. But it is not so much as milkers that the United States are interested in the breed, but as beef producers; and that in this capacity they are indeed largely interested will be proved when I say that the extraordinary demand for pedigree Herefords from the United States in the last few years has so increased the price of these cattle that the Hereford breeders are looked upon with envy by other breeders throughout the kingdom as having "struck a bonanza." That Herefords will repay a large expenditure is undeniable. Their tremendous development of flesh, their activity as feeders, their insensibility to changes of climate, their hardiness, their quiet and placid tempers, are just precisely the qualities needed for the improvement of our Western, Texas, and "Spanish" cattle. Their bulls, too, have a marvelous faculty of impressing their qualities on their get, and there is many a half-breed Hereford which is absolutely indistinguishable in appearance and quality from a pure bred one, so completely is the influence of the dam eliminated. Another point. The Hereford is specially strong just where our Western cattle are weak, viz, in the development of the flesh on the back. The back of a well ripened Hereford steer has been compared to a table, and the back of a Texas steer to a wedge. Volumes could not say more.

There were two remarkable sales of Herefords during the past year; one, the dispersal of Mr. Pitt's herd at Chadnor Court, and the other the dispersal of Mr. Turner's herd at Leen. Mr. Pitt established his herd in 1842 from four celebrated cows of the day. I present a little statement of the amounts received by Mr. Pitt at this sale.

Number of animals.	Value.	Average.
32 cows with two calves	$13,450 00	$420 00
25 calves	4,961 63	198 47
12 two-year-old heifers	7,818 05	651 50
3 two-year-old heifers	1,113 67	371 22
12 yearlings	3,995 87	333 00
7 bulls	2,800 00	400 00

Ninety-one animals averaged about $375 each.

The average of $651.50 for twelve two-year-old heifers has never before been equalled in England in any breed.

Mr. Turner's herd has been established for about eighty years, his grandfather being the founder. Since 1854 Mr. Turner has won with individuals of his herd 111 first prizes, 60 second prizes, 11 third, besides 52 special prizes. He received an average of $369 apiece for his animals, his cows and calves averaging a little higher.

These two herds were exceptionally fine and had a wide celebrity. Many of the animals went to the United States, making, with all others forwarded, a total of 1,800 pedigree Herefords sent to the United States from February 1, 1883, to February 1, 1884. This includes one lot of 300 sent to Baltimore in January of this present year.

The question naturally comes up now, whether this demand for the Herefords is a fancy or a fashion, likely to die out and let down prices. It is worth considering. I have said that the principal demand for the Herefords in the United States was as beef makers, but I did not intend at all to intimate that their merits as milkers were overlooked. On the contrary many breeders in the United States are enthusiastic over them as a dairy breed and quite a number of wealthy men are forming herds. Some go so far as to claim that the Hereford is the coming breed, which is going to carry all before it, and that the Short-horn will eventually fall before the Middle-horn, just as the Long-horn went down in the past. The high esteem in which the breed is held in the United States and the growing appreciation of its merits which exists in England preclude, it seems to me, the possibility of a fall in prices in the near future or in fact for many years. It is even possible that for a time prices may go higher than now. A gentleman writes me from Hereford County thus:

> I am now looking out for a lot (of pedigree Hereford cattle for America); they are more difficult to get, as the demand has been great and prices are much higher.

HOW TO EXPORT HEREFORDS.

By far the larger proportion of theHerefords sent to the United States go via Liverpool, though several large herds have been sent by way of Bristol. I am of the opinion that in many cases better facilities could be obtained via Bristol than are obtained via Liverpool. One reason I have for this opinion is the fact that several of the steamers plying in the lines from Bristol to New York are unusually high between decks, and extremely well lighted and ventilated—an important matter. Another advantage is that cattle can be brought from Hereford in the cars directly alongside of the ship's deck.

The Great Western Railway Company quote the following to me as about their average rates for transporting cattle from the town of Hereford to Bristol or to Avonmouth docks (a port of Bristol):

Half wagon-load consisting of 4 cattle	$5 46
Small wagon-load consisting of 7 fat cattle	8 20
Medium wagon-load consisting of 8 fat cattle	9 23
Large wagon-load, unlimited (holding about 10)	11 00

The Great Western Steamship Company, plying between Bristol and New York, inform me that their rates average from $25 to $30 per full-grown animal. The ship provides water and stalls, and their bills of lading contain this clause: "Ship not accountable for mortality or accident from any cause whatever." A herd of one hundred and nine Hereford cattle was carried on this line some time ago at the following rates: Cows and heifers, $24.33 each; calves, $12.16 each; sucking calves, $4.86 each.

A herd of fine Jersey cattle carried on this line subsequently, when freights were higher, paid an average of $30.50 each for full-grown animals.

In order to take proper care of valuable cattle in ocean transit, there should be one man for each twelve cattle. Competent men for this purpose can be hired in England for about $1.25 per day and all expenses paid, including a pass back to the port of departure. When a steamer gives a rate for carrying cattle, the pass over and back for a certain number of cattle-tenders is included. The foreman in charge of the tenders would of course get more than $1.25 per day, but in most cases he is the American agent or buyer, or is connected in some permanent capacity with the farm or the business of the purchaser. Such cattle of course are insured to their full value almost invariably, and are admitted, being breeding animals, into the United States free of duty. Certificates from a veterinary surgeon and from the consul at the point of departure invariably accompany such consignment.

HEREFORDS IN THE UNITED STATES.

Any account of Herefords in the United States would be incomplete without mention in connection therewith of the name of Mr. T. L. Miller, of Beecher, Ill. He was the first, or one of the first, to perceive what a boon to the stock of the United States the almost unknown Hereford would be, and for years he has persistently and enthusiastically advocated him in his Live-Stock Journal. In 1873 he imported from Hereford a two-year-old heifer, Dolly Varden, with a calf at foot. She has brought a live calf every year since, one of the first being the bull Success, "hitherto acknowledged as the best Hereford bull in the United States, and still alive and active. Dolly Varden and Success have been repeatedly exhibited and never beaten, whilst the get of Success has in several instances brought $1,000 per head."

The Hereford Times, of October 18, 1883, says:

> To this purchase of Dolly Varden and her calf, combined with the indomitable energy and perseverance of Mr. Miller, the brisk demand, present high favor and repute in which Hereford cattle are held is attributable.

Mr. Miller's neighbors in Illinois are following his example in importing Herefords. Messrs. G. Leigh & Co., of Beecher, Ill., have bought eight animals within the past few weeks from the herd at Felhampton Court; Mr. Culbertson, of Chicago, two; and Mr. J. V. Farwell, also of Chicago, sixteen, all from the same herd.

ACKNOWLEDGMENTS.

In conclusion, I wish to acknowledge the extreme courtesy with which my requests for information have been responded to by the breeders of Herefords. It is not always easy for a consul to obtain information. His requests sometimes are met with discourtesy, sometimes with indifference; but in this case only five letters out of about a hundred and thirty-five dispatched by me remained unanswered. In every case in which I had a personal interview with Hereford men, except one, every facility was placed at my disposal for a thorough investigation. I have to acknowledge, especially, the kindness, in connection with this report, of Thomas Duckham, esq., M. P.; of S. W. Urwick, esq., secretary of the Hereford herd-book; of J. Bowen Jones, esq., of Shropshire; of Lord Moreton, M. P.; of E. G. Clarke, esq., of Bristol; and of N. J. Hine, esq., assistant secretary of the Smithfield Club.

LORIN ANDREWS LATHROP,
Consul.

UNITED STATES CONSULATE,
Bristol, January, 31, 1884.

A table prepared by Consul Lathrop, of Bristol, showing the respective weights of the cattle exhibited at the eighty-sixth annual show of the Smithfield Club, December, 1883.

STEERS NOT EXCEEDING TWO YEARS OLD.

Herefords.	Short-horns.	Devons.	Sussex.	Red-Polled breed.	Scotch Highland breed.	Scotch Polled breed.	Cross-bred cattle.
Cwt. qr. lbs.	*Cwt. qr. lbs.*	*Cwt. qr. lbs.*	*Cwt. qr. lbs.*	*Cwt. qr. lbs.*	*Cwt. qr. lbs.*	*Cwt. qr. lbs.*	*Cwt. qr. lbs.*
11 1 10	12 0 20	10 2 10	12 2 24				13 2 24
13 0 12	13 1 14	10 1 14	13 2 25				11 2 14
14 0 20	13 3 4	9 0 10	11 1 8				11 3 22
12 2 24	12 2 23	8 2 0	12 0 2				13 0 0
13 3 18	12 2 26	9 3 23	12 1 8				12 3 27
12 0 20	11 1 10	10 0 20	12 2 25				12 0 21
	12 0 25	8 3 20	13 3 0				12 1 20
	12 0 0						

STEERS ABOVE TWO AND NOT EXCEEDING THREE YEARS OLD.

Herefords.	Short-horns.	Devons.	Sussex.	Red-Polled breed.	Scotch Highland breed.	Scotch Polled breed.	Cross-bred cattle.
15 1 4	16 0 16	14 1 4	13 3 20	12 2 0		16 2 26	16 3 5
15 1 6	18 2 5	12 1 22	15 0 4	12 1 24		16 3 8	17 0 21
17 0 24	16 3 10	12 2 2	19 0 5	14 0 18		16 2 20	17 1 4
15 2 21	14 1 21	13 3 6	18 3 24			13 2 20	17 1 4
16 1 4	17 1 0	14 3 10	14 0 20			16 0 8	18 0 22
15 3 12	17 2 26	15 1 9	18 0 0			15 0 15	17 2 6
15 0 24	17 3 8	12 3 0	16 0 2			16 1 4	15 3 26
14 3 22	17 1 4	14 3 12				14 2 10	16 0 24
	18 0 10					18 1 10	17 0 16
	16 2 20					19 0 20	17 0 16
	18 2 4						
	18 3 8						
	19 0 27						

STEERS ABOVE THREE AND NOT EXCEEDING FOUR YEARS OLD.

Herefords.	Short-horns.	Devons.	Sussex.	Red-Polled breed.	Scotch Highland breed.	Scotch Polled breed.	Cross-bred cattle.
17 3 14	19 3 0	17 2 6	20 1 0	15 1 20	15 3 20	18 2 10	19 1 24
18 2 16	19 1 20	17 2 6	18 3 2	17 3 6	15 3 14	17 0 0	19 3 3
	18 2 16	15 3 20				21 0 23	20 2 20
		14 2 7				19 0 22	
		14 0 18				17 1 0	
		17 1 22					
		13 2 2					

HEIFERS NOT EXCEEDING FOUR YEARS OLD.

Herefords.	Short-horns.	Devons.	Sussex.	Red-Polled breed.	Scotch Highland breed.	Scotch Polled breed.	Cross-bred cattle.
17 0 18	18 1 5	14 0 1	16 3 14	12 1 24		14 1 10	11 1 6
17 0 26	16 3 12	13 3 12	14 0 8	13 3 22		17 2 22	13 1 5
18 3 27	16 3 20	12 1 20	14 0 18	9 2 18			13 3 16
	16 1 10	12 0 0	17 3 19				14 0 18
	15 3 18	13 0 2	13 3 2				17 3 20
	15 3 20		14 3 26				13 3 10
	16 0 14						

COWS ABOVE FOUR YEARS OLD.

Herefords.	Short-horns.	Devons.	Sussex.	Red-Polled breed.	Scotch Highland breed.	Scotch Polled breed.	Cross-bred cattle.
20 3 2	21 0 0	13 3 6	16 0 16	17 2 24	14 0 5		19 3 0
	19 2 12	12 1 13	16 2 6	14 3 4	13 2 10		17 2 20
	18 1 8	17 1 4	15 3 10	13 0 14	11 3 12		14 2 24
	19 1 18	13 1 10	14 0 21		11 1 0		17 3 15
	17 0 8	13 3 15	20 0 5				
	16 3 14						

HEREFORDSHIRE AND HEREFORD CATTLE.

REPORT PREPARED FOR CONSUL DOCKERY, OF LEEDS, BY MR. JOHN KERSLEY FOWLER, PREBENDAL FARM, AYLESBURY.*

DESCRIPTION OF HEREFORDSHIRE.

In writing an account of this very valuable and beautiful tribe of cattle, it is necessary to give a description of the county which gives its name to the breed, and also of the soil and climate, as well as the general characteristics of the district, as this particular breed of cattle is specially adapted to certain localities in England, and, although I will not venture to affirm that they will not thrive under other climatic and geological circumstances than their own county, from my own personal experience I find that they are more adapted for those districts which partake more or less of the character of Herefordshire.

This county is situated in the west midland district of England, adjoining the Welsh counties, and is bounded on the north by Shropshire, on the east by Worcestershire and Gloucestershire, on the south by Monmouthshire, and on the west by Radnorshire and Breconshire. It will, therefore, be seen that it has no sea coast, but the river Wye running through the county gives it communication with the sea, through the Bristol Channel. It is well supplied with railway communication, the Midland giving it a direct route to the north, and the Great Western to the south and west, and also to the metropolis. The city of Hereford itself is, also, connected with the Northwestern line, via Malvern and Worcester, thus giving the county every means of supplying the various grazing districts of England with numbers of excellent store cattle, as also for the dispatch of fat animals to the markets of the great metropolis and the teeming populations of the many thriving towns in the north.

The soil of the county is varied, the larger portion is a red clay, as also strong loam. Around the town of Ross, where some of the choicest specimens of the breed are found, the soil is a loamy gravel or light loam. The old red sandstone forms also a considerable portion of the county, and some of the hills are limestone. The valleys are particularly adapted for the feeding of cattle, as they are moist and rich, and the soil is of a mixed character, from the continuous washing away of the hills, and the débris finding its way to the lower grounds, and forming a rich alluvial deposit well suited for the production of the finest grasses. The hill-sides and higher portions of the county are eminently suited for the breeding and rearing of cattle, and the comparative mildness of the climate is favorable for the health and early development of the calves.

The acreage of the county is 532,890 acres, divided into or about the following proportions:

Orchards, 27,000; woodlands, 37,000; and the remainder for agricultural operations. According to the last Government returns there were under—

	Acres.
Corn crops	95, 299
Green crops	32, 813
Clover and rotation grasses	34, 108
Permanent pasture	265, 661
Bare fallow	11, 247
Hops	6, 416

---

* Juror at the Paris Exposition of 1878.

It will therefore be seen that the permanent pasture far exceeds all the other portions of the land put together. The population in 1881 was 118,147. Very few of the people are employed in manufactures, but many find employment in the autumn in hop and fruit gathering.

THE GREAT CATTLE FAIR IN HEREFORD.

The city of Hereford is situated somewhere near the center of the county, and is in latitude 52° 4′ north, and longitude 2° 54′ west. The climate is on the whole temperate. The city is small, and has been the seat of a bishopric from the earliest times, for more than twelve hundred years. The cathedral is very beautiful, but does not rank among the largest of the English fanes. It has portions of Norman work in it, and since its restoration has been made one of the handsomest interiors in the Kingdom. The city proper is rather poor, but some of the streets and the market place are large and spacious, and at fair time their appearance is very wonderful, every portion of the streets, even up to the cathedral yard itself, is crowded with the "white-faced beauties" of the county; while Shropshire, Monmouthshire, Breconshire, and even Gloucestershire send their contingents. It is indeed a remarkable sight, being different to anything of its class in England, as the thousands of cattle brought together are all of one type, deep brownish-reds with white faces, and some other portions of the body and tips of tail white. There is no interspersing of Shorthorns or other breeds, an occasional Devon is seen, but that seems to be an accident, and the shouting of drovers, the bellowing of the cattle, and the general hum of conversation whilst the deals are made, form a singular and very amusing sight. The great fair takes place in the third week in October, and as many as from 8,000 to 9,000 head of cattle have been brought for sale during that time. Some years ago dealers like Carwandine, Pardington, Jones, Knight, and Price were accustomed to bring some hundreds, and generally sold them to the graziers of the midlands or to other dealers who brought them up to the great markets at Banbury, Aylesbury, and Northampton, where there was always a ready sale. The trade now seems quite changed, and but few good animals ever reach the midland markets, as the graziers themselves go down by rail in a few hours and buy largely of the breeders, or dealers, who get together on their own premises lots of from 30 to 100 for their selection, and it is only rarely that men can be suited at the old markets.

HISTORY OF THE HEREFORD BREED.

I am greatly indebted to the writings of the late Mr. Dixon, a well-known agricultural writer, for much of the information contained in this paper, as well as to my good friend Mr. Duckham, member of Parliament for Herefordshire, who was the editor of the Hereford Herd-Book, and who has done as much, or perhaps more than any other man, to bring this noble race of cattle prominently before the public at the present time, who has given me much valuable information, and I cannot do wrong in quoting from these most reliable authorities for many statements which I shall make in this paper. I will also give my own personal experience as a grazier, and judge at the royal and other agricultural shows, where I had many opportunities of getting well acquainted with this breed.

Old Fuller, who was a quaint writer of more than two hundred years ago, says of Herefordshire, "that it doth share as deep as any county in the alphabet of our English commodities, though exceeding in *W.* for wood, wheat, wool, and water," and "that its wheat was worthy to jostle in pureness with that of Heston, in Middlesex, which furnished manchets for the kings of England, and its Wye salmon were in season all the year long." And before his day "painful Master Camden" described the county as "not willingly content to be accounted secondshire for matters of fruitfulness." Yet both writers are silent as to cattle, and Drayton sang of "fair Suffolk's maids and milk," of the hogs of Hampshire, the calves of Essex, and how

Rich Buckingham doth bear
The name of "*Bread and Beef;*"

yet he says nothing of these attributes of Herefordshire.

Many writers were of opinion that the Herefords were descended from cattle from Devon and Normandy, which were of a deep reddish brown color, and that the white faces were an accident from a singular sport of the breeding of a white-faced bull by a noted breeder of the last century, Mr. Tully, of Huntington, near Hereford. The story I have heard related as follows: That the cow-man came to him, on his coming out of church one Sunday, and told him that his favorite cow, who was daily expecting to calve, had produced a bull-calf with a white face, and this had never been known before. Report says the master ordered it at once to be killed, as he dared not let it be known that he had such a stain of blood in his well-known herd; but the man begged him to go and see it, as it was the finest calf he had ever seen. Mr. Tully, when he had seen it, agreed with his man that it was a wonder, and that he would, out of curiosity, rear it. He did so, and he proved to be a very remarkably fine animal, and he used him on all his best cows, and his progeny became celebrated for their white faces. Many old chroniclers say that the county was noted for its breed of white cattle on the banks of the Wye as far back as the tenth century, but they had red ears, and it is recorded that Lord Scudamore in, or about the year 1660, introduced some red cows, with white faces, from Flanders, and this may have been the reason that the noted Tully bull, after a lapse of more than a hundred years, might have cropped up, as a sport, from the well-known deep red cattle of the country. It must not be considered that the white face is the only type of the purity of this breed, as the mottled face is considered by many breeders as of greater value than the pure white, and I can myself testify that some of the finest cattle I ever grazed, and some of the best I ever saw, have been mottled-faced and light-brindled; in fact those of the last-named type have shown the greatest aptitude to fatten, on the grass, of any, and many graziers have told me the same.

Mr. Eyton, of Eyton Hall, Salop, was the founder of the Hereford Herd-Book in 1845, and when he commenced it, he found it necessary to divide the Herefords into four distinct classes, viz, the mottled-faced, the dark-gray, the light-gray or white, and the red with white face. Yet, after the lapse of only thirty-eight years, people question the purity of the breed, if they have not the characteristics of the well-known white face and markings.

Mr. Duckham says, "the present uniformity of the color is due to the influence of the bull," and this is a remarkable corroboration of my views, expressed in a paper on "Breeding, facts and principles," which I read at a meeting of the Central Farmers' Club, some few years since, when I propounded the dictum (which, by the bye, was not new), "that the male exercised the external characteristics, and the internal organization followed the female," in nearly every class of animal. Long before the commencement of the herd-book the Herefords had made "a reputation and a name," by being continually successful at the Smithfield Club annual fat cattle show, from its establishment, in 1799, by Mr. Westcar, of Creslow, near Aylesbury, Bucks, and who, for twenty years in succession, won the premium prize with a Hereford ox, against all kinds of cattle. I had not an opportunity of knowing Mr. Westcar, as he died before my day, but I had been for many years on intimate terms with his relative and successor, Mr. R. Rowland, who gave me many interesting stories of Mr. Westcar, and who was, undoubtedly, the first man to bring the Herefords to the front, against all the world. I remember Mr. Rowland telling me, whilst standing in the midst of the far-famed Creslow Great Ground, and on the spot, marked by a clump of trees, where Mr. Westcar's lifeless body was found, he having fallen dead from his horse, how the Duke of Bedford, in the latter part of the last century, went down with Mr. Westcar to Hereford in his carriage and four post-horses, taking two days for the journey, and stopping one night on the road at the well-known country inn, the Staple Hall, at Witney, and accompanied by Lord Berners, in another carriage and four, with some ladies and other members of their families, to attend the great fair at Hereford, and where the duke desired Mr. Westcar to order dinner for a hundred persons at the principal hotel, and to invite all the more celebrated breeders and dealers to meet him. He described the annoyance of some of the dealers at the noblemen being brought down to see these grand bullocks, which they had only seen in the Creslow pastures, as it had had the effect of raising the price of the cattle in the fair at least £1 per head. After dinner his grace and Lord Berners announced their desire to have from ten to twenty of the best cows that could be found and two bulls, to bring into Bedfordshire, there to establish a herd on their estates. Lord Berners, who was a breeder of Longhorns, gave up the breed and took to Herefords. This visit of the Duke of Bedford, with the continued success of the breed in the show yard, at Smithfield, by Mr. Westcar, brought them prominently into notice, and firmly established their merits. Sir Brandreth Gibbs, the honorary secretary of the Smithfield Club, in his history of the club, states that at their first show Mr. Westcar's prize ox measured 8 feet 11 inches long, 6 feet 7 inches high, 10 feet 4 inches girth, and that he was sold for 100 guineas. This animal was bred by Mr. Tully, of Huntington, and weighed 247 stone, dead weight, 8 pounds to the stone. Enormous as the dimensions of this ox were, they were far exceeded by another Hereford, fed by Mr. Grace, of Putlowes, near Aylesbury, which was 7 feet high, 12 feet 4 inches girth, and weighed 260 stones, of 8 pounds, dead weight. Mr. Duckham mentions that about the years 1812 or 1813 Mr. Potter sold for Mr. Westcar at the Metropolitan Christmas market fifty Hereford oxen that averaged 50 guineas each, making 2,500 guineas; and he mentions that Mr. Smythies, of Marlow, Salop, obtained the following extract from Mr. Westcar's book for the sale of twenty Hereford oxen at different periods from 1799 to 1811, and which I can corroborate, as the same was shown me by Mr. Rowland, when visiting him at Creslow. **The list was confined to those which sold for £100 and upwards:**

Date.	Oxen sold.	Value.
Dec. 16, 1799	2 oxen to Mr. Chapman	£200
Dec. 4, 1800	1 ox to Mr. Chapman	147
Dec. 13, 1800	1 ox to Mr. Harrington	100
Nov. 26, 1801	6 oxen to Messrs. Giblett & Co	630
Nov. —, 1802	1 ox	100
Nov. 31, 1802	1 ox to Mr. Chapman	126
Dec. 4, 1802	2 oxen to Mr. Horwood	200
Dec. —, 1803	1 ox to Mr. Chapman	100
Dec. 19, 1803	1 ox to Mr. Reynolds	105
Dec. 19, 1803	1 ox to Mr. Giblett	105
Dec. 5, 1804	......do	105
Dec. 4, 1805	......do	100
Nov. 26, 1811	1 ox to Mr. Chandler	105

The whole 20 sold for £2,123, or an average of £106 6*s.* each.

I have also seen at Mr. Ledbrook's, who succeeded Mr. Grace at Putlowes a few years since, when the price of meat was lower than in the beginning of the century, 50 oxen tied up for Chistmas at the end of November, for which he had been bid £2,500; the price was rather under 5*s.* per stone, but this would have made them average over 200 stone per head. The class of animal I have been describing is now no more. They were five-year old worked beasts, and even older, which had been for two or three years harnessed to the yoke, and had therefore attained great size. Working in the plow is now comparatively rare, and early maturity is the aim of all the best farmers in England, and the Hereford breeders are not likely to be left behind. It is a rare thing nowadays to purchase a Hereford steer at a fair over three years old. When I began farming, thirty years ago, I bought a lot of beautiful three-year-old Hereford steers in October at £13 10*s.* each, in poor condition. I gave them the run of the straw yard, and 3 pounds of oil-cake per day, and turned them out to grass in May, and sold them in August and September at from £23 to £24 each, giving me some excellent manure and a good profit on the animals. The price of this class of beast rapidly rose, and now they can scarcely be bought under £21 to £22 each, and as they only make about £26 or £27 each when off the grass, they do not pay enough. I once went to a Hereford fair at Easter and bought 10 of the finest old worked beasts I ever saw at £29 10*s.* each. They were large, fine-framed animals, and when they arrived at Aylesbury Baron Mayer de Rothschild saw them and begged I would let him have them, and I consented on condition that he gave me a round of one of them for my Christmas dinner the same year. He took them to Mentmore, and some made £46 to £47 each at Christmas, and others went off the grass in October at £38 to £40 each, but such aged beasts are not found now. Amongst the most noted graziers of these cattle was the late Mr. Senior, of Broughton pastures, near Aylesbury. This gentleman was a very successful exhibitor of Herefords after Mr. Westcar's death, but of late years he grazed Sussex beasts, as he could not get the worked animals from Herefordshire. Mr. Duckham and other writers on Herefordshire cattle say that the county is not by any means a good grazing district, but eminently adapted for breeding and rearing cattle, and that no class of animal thrives so well, when changed on to the fine pastures of Buckinghamshire, Leicestershire, and Northamptonshire.

As Mr. Westcar's name and his residence at Creslow has been so often quoted by all writers upon the Herefords, I must be pardoned for giving a slight sketch of this famous grazing district. "The great ground," as it is called at Creslow, is, as before stated, about 330 acres and is very undulating, and bounded on two sides by a brook, a tributary of the Thames, and on the other two sides by a large double ox-fence, with large elm trees affording shade to the numerous head of cattle grazing there. I have seen nearly 250 head of horned stock and 500 sheep and lambs, with 20 mares and foals, grazing in this one field, and all getting fat. It is jocosely said that the cattle are turned into the field in May and by the time they have walked around the inclosure they come out fit for the butcher. The old mansion had formerly been a monastery, and the estate belongs to the Lord de Clifford, in whose family it has been for some centuries, and it is stated that Rosamond de Clifford, "Fair Rosamond," was born there. Nothing can exceed the rich pastoral beauty of this district. From the upper ground the eye wanders over the far-famed vale of Aylesbury, the old town, the "Ægelsbireg" of the Saxons, standing in the midst the rich pastures of Whitechurch; Quarrendon, with its ruined chapel of the fifteenth century; and Fleet Marston, in which parish is Putlowes, formerly mentioned as the rival of Creslow as a feeding pasture, and a rare tract of grass land stretching away for more than 15 miles along the valley of the Thames.

Sir Brandreth Gibbs, in his "History of the Smithfield Club," mentions an incident of some interest in 1825. There was a sweepstakes between three Herefords belonging to the Duke of Bedford and three Durhams belonging to the right honorable Charles Arbuthnot, which was won by the Herefords.

Mr. Duckham says that from the establishment of the Smithfield Club in 1799 to 1851 all the different breeds and cross-breeds were shown together, but since that time they have been exhibited in distinct classes. And, as far as can be learned, during the time they were shown together the Hereford oxen and steers won 185 prizes; the Shorthorns, 82; the Devons, 44; the Scotch, 43; the Sussex, 9; the Longhorns, 4, and the cross-breeds, 8; thus showing that the whole of the prizes won by all the other breeds and crosses in the Kingdom were 190, or only 5 in excess of the number registered by the Herefords alone.

Mr. Discau says that during fifty-three years to 1851 the Shorthorns by their females made up considerably to the total of the Herefords, as they numbered 174 prizes to the Herefords 207.

It is interesting to know how the Herefords have retained their former renown, by their comparatively youthful prowess at the present day. We find that Mr. Heath showed his gray beast at Birmingham, winning first honors, with a girth of 9 feet 7 inches; and his Hereford cow at three years and ten months measured 9 feet in girth. Mr. Shirley's gold-medal steer at two years and seven months girthed 8 feet 7 inches. And he averred that up to seventeen months old he had had only an ordinary calf and stock treatment. It will therefore be seen that the breed is not only not deteriorating but is likely to maintain its position against all competitors.

THE HEREFORDS AS DAIRY CATTLE.

Having said so much of the feeding qualities of these animals, I must now allude to their milking properties. Generally they are not considered such good "fill-pails" as their rivals the Shorthorns or Aryshires, nor such butter producers as the Channel Islands breeds, yet their butter-making qualities are of a high order. I quote from Mr. Duckham, who says Mr. Read, of Elkstone, finds the Herefords retain their general aptitude to fatten, and that in the team they are excellent and that they have been used for dairy purposes for nearly fifty years on the farm, and that he raises his calves by hand after a few days old.

Mr. James Mappowder, of Blandford, Dorset, says that Hereford dairies are becoming very common in that county; that they let nearly one hundred cows to dairy people, and that if he buys one of any other breed to fill up the number they always grumble. His system is to let the cows at so much per year, finding them in land and making the hay; the calves being reared by hand with skim milk and linseed until three months old, and they are then turned out to pasture.

Mr. Olver, of Penhallow, Cornwall, says:

> I rear my calves on skim milk. It is generally said Hereford cows are bad milkers. That is contrary to my experience. My cow Patience, bred by Mr. Cooke, of Moreton House, had given 14 pounds of butter in a week, and Blossom, bred by Mr. Longmere, Buckton, Salop, gave 22 quarts of milk, yielding 2½ pounds of butter per day.

From Ireland and Scotland reports show that excellent results have been attained. It is fair to say that my own experience is contrary to the opinion that they are better for the dairy than Shorthorns, as when I was judge of cattle at Hereford, some few years since, there was a milking competition, and we had all the competitors in the class very carefully milked, and both the first prizes were obtained by Short-horns of high class pedigree, beating all competitors, even including Aryshires and Jerseys.

THE HEREFORD IN FOREIGN COUNTRIES.

The Herefords have proved themselves well adapted for foreign and colonial countries. Mr. Stone, of Guelph, Ontario, says:

> I am an extensive breeder of Shorthorns, which breed I think very highly of; but I have also purchased some Herefords from Lord Bateman's and Lord Berwick's herds, and am highly pleased with them. The climate is very variable, varying in twenty-four hours from 30 to 40 degrees, and that the Herefords stand the changes equal to any breed.

Mr. Edwards, Knockalva, Jamaica, says that for many years they had no change of blood till 1858, when Sir Oliver (1732) and Malcolm (1646) were imported, and that they did the greatest service in the island; that this breed are good workers, hardy, and of great aptitude to fatten. Mr. Merryman, of Maryland, and Mr. John Johnston, of New York, testified to the breed standing the variations of the climate remarkably well. Mr. W. Dangau, from Hunter's River, Australia, in addition to their feeding powers and hardiness of constitution, found they were excellent in traveling long distances and that they would do from 250 to 300 miles better than any others. I have, therefore, shown that the Herefords are admirable for foreign countries. Amongst the most noted strains of blood I find from Leopold (1) and Wellington, which bull was sold in 1816 for £283, that the mottled faces are mostly descended, and Victory, which was a dark gray, and Cotmore (376), which was a white-faced bull, and Brockwood, which was a light gray, were all specially noticed in the first number of Mr. Eyton's herd-book.

Mr. Dixon remarks that there were not many points of difference between the dark grays and the mottle faces, the latter of which were known as Ben Tomkins sort, and the Rev. Mr. Smythies, of The Lynch, was one of the best and most spirited breeders of his day, and offered to show a hundred Herefords against the same number of Shorthorns from any herd in England. All these remarks show that much pains and infinite care have been taken in perfecting this noble breed, and for the best lines of blood the herd-book must be consulted.

The breeders put their heifers to the bull at from eighteen months old to two years, and the calves generally run by the side of their dams for several months. The cows are put to the bull at a certain time, so that they may generally come due to calve in the early spring, and to meet the grass; although some others like the cows to calve about October and November, housing the calves, and keeping them on with a little milk and cake, so as to be strong by the summer. Some breeders think that by letting the calves suck the mothers it prevents their coming into season for the bull as early as if they were weaned at once, but from inquiries I have made I find but little difference in it. This is contrary to my own and some other breeders' practice, as I have found the cow lies barren, especially Shorthorns, for some months after calving if the calf lies night and day with the dam. Several Herefordshire breeders are in the habit of giving their calves, at a very early age, good old beans, which should be given whole, and in a few days they begin to crack them after rolling them about in their mouths, and secreting that frothy saliva which seems to be so condusive to a calf's well doing. I have tried the plan and can speak highly of the practice, no food can be better, as beans are peculiarly fitted for forming bone and muscle.

On the whole, I believe the Hereford breed, as a flesh-forming animal, is second to no breed in the world. The meat itself is equal, when well fed, to the best Scotch or Devon, and every authority proves they do well when imported into other climes. In England it is found that the best grass lands are most calculated for their flesh development, and when tied up, liberally fed, and well cared for, they can hold their own in the show yard against any breed in the country. As dairy cattle the Short-horns beat them, but, taking all things into consideration, England may well be proud of her white-faced Herefords.

JOHN KERSLEY FOWLER.

PREBENDAL FARM, NEAR AYLESBURY,
January 7, 1884.

COMPARATIVE MERITS OF BRITISH CATTLE.

REPORT PREPARED FOR CONSUL DOCKERY, OF LEEDS, BY MR. JOSEPH LAY FAULKNER, VETERINARY SURGEON, SOUTH MILFORD.

SHORTHORNS.

In submitting a report of the merits and propensities of our various British breeds of cattle, I will commence my remarks by giving a brief sketch of the modern history of the Shorthorn, or Durham cattle—so termed from the parent stock inhabiting the county of Durham—which have special claims upon the attention of both home and foreign breeders inasmuch as it has the power of more easily adapting itself to all soils, climates, and circumstances than any other animal of the bovine breed, and contributes a greater weight of prime beef, butter, and cheese to our markets, directly and by their influential crosses, than half a dozen of the other established breeds put together. The combination of their milking and feeding properties fully entitles them to the premiership of the general purpose cattle. If we take London and other great dairies as a criterion of the milking qualities, we have abundant proofs of their excellent properties, as at least 90 per cent. are Shorthorns, which perform the double duty of milking and feeding simultaneously and when dry are fit for slaughter. The recent scrutinizing test which they have undergone during the late competition for dairy honors at the Royal Agricultural Society's show held at York, in July, 1883, and in the London dairy show, in October last, prove their worth. At both of these places the first and second prizes were triumphantly carried off by Shorthorns; and as an additional proof of the Shorthorns' superiority, the Queen's two years and eight months old pure Shorthorn heifer eclipsed all other breeds, ages, weights, and sex, and deservedly carried off the much-coveted champion prize at the fat-cattle show held in London December, 1883. The dairy tests were conducted on the most scientific principles, and leave no doubt as to a correct decision having been arrived at. I do not think that the most essential properties of the pure Shorthorns are so universally known as they ought to be. The foreign buyers, whose tastes have been carefully studied, do not, as a rule, make milking properties a *sine qua non*, but give their favor to attractive appearances, and, above all, long ancestral line, without which in their eyes no animal is worth their notice. Now, many of our first-class breeders have neglected the careful cultivation of dairy productions, and obliterated them altogether in some of the purest and most valuable breeds. These proceedings have had a damaging influence on the breed generally. Instances are not wanting where paper pedigrees have been held as the only virtue to be studied, while nature's bountiful provisions have disappeared. Refinement has its limits, and when pushed beyond those limits degeneracy is the result, and the breed is often condemned when a jury would find a true bill against the breeders.

Forty years ago some of the highest bred Shorthorns were extraordinary dairy cows and possessed great aptitude to fatten when dry, but, though the great demand for showy animals has somewhat interfered with the careful cultivation of these properties, which consequently have been slightly impaired, this only exists when breeders have not accounted dairy capabilities of sufficient interest and importance to occupy their serious attention. Besides, to do so would entail an infusion of new blood, which would incur the disapproval of a clique of connoisseurs, who might declare the innovation an unpardonable departure from the well-defined paper line and rule system of breeding so extensively practiced by some of our pioneers, who, unfortunately for the cause, have paid too little attention to the dictates of nature. The best all round general purpose cow can be selected from the old Teeswater Shorthorns, which are still to be found in great numbers inhabiting the banks of the river Tees, in the north of Yorkshire. These are the parent stock of our most refined breeds of Shorthorns, and still retains the substance, constitution, and udder for which the breed has long been distinguished. From this foundation, with proper selections, a superior class of animals can be raised and modeled to suit circumstances.

The possession of so many worthy properties admirably adapt them for exportation, and I know of no other breed that I can be more confident in recommending to the notice of foreign buyers. The male animals of this breed are most impressive sires, and stamp their own characteristics on the progeny in a marked degree, which is, perhaps, more distinguished abroad than at home.

One of our earliest improvers of the Tees water Shorthorns was Charles Collings, who with his brother became a considerable farmer about 1770, but Charles has the credit as an early founder of this breed.

In the year 1810 his herd was sold by auction with the following result:

	£	s.
17 cows	2,802	9
11 bulls	2,361	9
7 bull calves under twelve months	697	15
7 heifer calves	942	18
Total	6,804	11

Since then a descendant of a calf sold at this sale (Young Duchess) has realized more money than the whole herd was sold for. One, two, and three thousand guineas were frequently paid for members of that tribe or family, of which there is a goodly number in England at the present time and which are still held in high estimation.

The influence of a good sire is shown by the following statement: A remarkable animal termed the Durham ox was got by one of the bulls sold at the above sale out of a common cow. The ox was sold for public exhibition, from which circumstance their sprung up a great desire to possess and improve the Shorthorns in distant quarters. The ox, after being exhibited for several years, was slaughtered after two months illness, which reduced its flesh considerably, but its dead weight of meat, without tallow or offal, was 2,322 pounds. Many other instances of great weignt can be recorded, viz:

	Pounds.
Live weight of steers under four years old	2,212
Live weight of heifers under four years old	2,049
Live weight of cows	2,352
Average dead weight:	
Of matured ox when fed in the ordinary way for market	920
Of heifer when fed in the ordinary way for market	800
Of cow when fed in the ordinary way for market	880
Milk:	
Annual average weight	8,000
Weight to 1 pound of butter	24
Weight to 1 pound of cheese	10

Soil.—Alluvial and light loam in East Riding; in West Riding, brown clay.
Climate.—Mean temperature, 49°.4.
Color.—Red, white, and roan.

HEREFORDS.

Herefords are an old established breed of high renown, whose fame has gone to the antipodes as possessing many highly meritorious properties, the principal of which is its fattening propensities and high quality of beef. A hardy, strong constitution seems to pervade the whole family, as no signs of delicacy or degeneracy ever appear in their ranks. These characteristics commend them to the notice of home graziers and breeders abroad. For several years past there has been a rush to secure the best specimens on offer for export, and some hundreds of fine animals have recently been consigned to enterprising breeders across the Atlantic. The chief merit of the Hereford is their beef productions; they have little pretension to the supply of the dairy. The calves, as a rule, run with their mothers, whose parental duties in many cases are heavily taxed, but this defect is occupying the attention of many breeders, and it can be removed in time by careful selections and proper observance in mating them. They inhabit large tracts of land partially surrounded by the Welsh hills—land which is well calculated to develop its true character to full perfection. The breed has long been ascribed the best in the west of England. The uniform character has become a stamped standard and is universally acknowledged, and is found to answer admirably in Australia, New Zealand, Canada, and the United States. They are very quiet and contented animals, and stand a long sea voyage well, without falling off in condition. Death or difficulty rarely occurs in transit. The origin of the Hereford was from the cattle of the county, from which selections were made, and the breed as it now stands owes all its reputation to modern changes. In the latter part of last century a Mr. Tompkins started a system of breeding which ultimately exercised great influence on the stock of this part of England. Size, adaptation to the dairy, and the purposes of labor were the chief properties studied by the breeders. Two cows fell into the hands of Mr. Tompkins which had an extraordinary aptitude to become fat, on which account he retained them for breeding. One of them, with more white on, he named Pigeon, and the other, a rich red with spotted face, he called Mottle. Mr. Tompkins established his Herefords from the existing breed of the county, and not by mixture with dissimilar kinds from other quarters, and although the improvement commenced in the last century, the Hereford breed was late in being prominently brought before the public as one possessed of the valuable properties for which it is now so justly esteemed.

	Pounds.
Live weight of four-year-old ox at Smithfield show, December, 1883 (offal, 8 pounds to the score)	2,486
Live weight of four-year-old heifer at Smithfield show, December, 1883 (offal, 8 pounds to the score)	2,127
Live weight of four-year-old cow at Smithfield show, December 1883 (offal, 8 pounds to the score)	2,329
Milk, annual average	3,000

Soil.—Deep-red loam and clay, lighter and poorer near the Welsh hills.

Climate.—Mean temperature, 49°.7.

Color.—Red, with white face and white streak down back, and a broader one on the belly.

An old established breed, without foreign admixture.

DEVONS.

The Devon is an old and well-defined breed, and is honored with standing first in the catalogue at the Christmas fat-cattle show in London, where it has been known to obtain the highest honors. They are to be found in the greatest purity and perfection in the northern part of their county and a portion of Somersetshire. They are very compact and graceful in appearance and light of bone. Their uniform, deep-red color, peculiar to the North Devon, goes to prove their freedom from any admixture or foreign element, which gives them a high standard of purity.

The purest bred ones are somewhat wanting in size for general purposes, and their improvement is slightly impeded by show-yard decisions, which are invariably in favor of small, compact animals, which no doubt are admirably adapted for their own locality, where they graze well and produce an excellent quality of beef, but they cannot surpass (as many of their ardent admirers try to maintain) some animals of greater weight in arriving at maturity at an earlier age. Therefore they are not eagerly sought after for rich feeding districts in other quarters. There are cases in which great weights have been attained by single animals, but this is not a characteristic of the breed, and will be alluded to hereafter. The stronghold of the pure North Devons is not the richest parts of Devonshire and Somersetshire. The soil is light and varied, in some parts hilly and uneven.

In the richer alluvial plains and near the coast a heavier and coarser class of Devons are kept, for which no special attention is paid to pedigree or refinement. Some splendid steers of this (as well as the North Devon) class reach the London market, where they soon change hands at remunerative prices.

North Devon is a breeding and grazing district, calves are mostly reared with the cows, and often a greater number of calves are seen in the field than cows. The yearling heifers run out through the winter, only receiving a little assistance during a storm. The yearling steers being on their way to the butcher, are kept in yards and receive a moderate allowance of straw and turnips during the winter months, and have liberal treatment until ready for the butcher at three and four years old.

The quantity and quality of Mr. Skinner's cow Myrtle, during the trials at the London show, was a great surprise to all who were not thoroughly acquainted the full capacity of the Devons. The cow was milked at 8.30 a. m., and again at 7.30 p. m., when the result was 26 pounds of milk which gave 14.75 percentage, 5.28 of fat; total award, 87.80. Age of cow, four and one-half years. She calved on July 4, and was tested on October 3, 1883. The solids, which are in excess of the Jersey, is a great achievement, and an event worthy of notice in agriculture, together with the extraordinary weights attained by some highly forced animals. This cow Myrtle gave 50 pounds of milk per day for a considerable period after calving (second calf), and milked for over a year at her first calf. The journey to London and other exciting causes, which are unavoidable in a show-yard career, would to some extent tend to reduce the quantity of milk.

The largest Devons and many of the best milkers are seldom seen in the show yard, as prizes, as before stated, generally go to the most symmetrical. The late Mr. Skinner, father of the present Mr. Skinner, exhibitor of the cow Myrtle, showed some Devon oxen in 1853 (winning at Bridgewater and Taunton Christmas meetings) scaling 1,600 pounds dead weight. This weight is enormous. These animals had, no doubt, been employed in farm labor for some years, and then forced for show. Mr. Skinner has recently sold a bullock under three years old, weighing (dead weight) half a ton. The top average weight for well fed steers three to four years old, is 720 pounds, dead weight; some reach 1,000 pounds with extra attention; but 720 pounds may safely be taken as a fair average for fully-matured Devon steers, although 800 pounds is not unfrequently reached by choice beasts. Cows, when fat, will average 800 pounds at six to seven years. Bulls often weigh, when very fat, a ton (live weight). A selected dairy of cows will average from 500 to 600 gallons of milk a year, many giving up to 700 gallons, and 300 pounds of butter. These are exceptional cases. A prevailing custom in Devonshire is to let cows to dairymen for the season, £13 each being about the average paid.

	Pounds.
Live weight:	
Four-year old ox, at Smithfield show, December, 1853 (offal, 8 pounds to the score)	1,966
Weight of heifer, at Smithfield show, December, 1883	1,600
Weight of cow	1,934
Milk:	
Annual average	3,500
To pound of butter	22
To pound of cheese	9

Climate.—Mean temperature, 50°.

Color.—All red. All old breeds established by selections from existing breed of the country.

POLLED ABERDEEN AND ANGUS BREED.

This breed has long ranked amongst the most valuable converters of vegetable into animal food, and few can excel them for the return when pitted against other breeds, acre for acre. The other Scotch breeds are on a par as to age at maturity, but the Aberdeen may have a little advantage in weight. For long ancestral purity of blood (if it be of importance) it must yield that honor to the Galloway and West Highlander. In some cases they have equaled the ponderous Short-horn in weight. They do not possess the regular uniformity of type and character of the Galloway, but no good end can be served for practical purposes by describing the origin of the breeds. Authorities agree that our existing Pollies are descended from horned cattle, and when the departure from the ancient order of things took place can only be conjectured. These Polled varieties are grouped in three defined breeds, viz, Norfolk, Galloway, and Aberdeen. The latter formerly embraced a variety of colors, but since the systematic improvement has set in, all shades of color, except black, are at a discount, and it is now black and nothing else. They are now being modeled to the breeder's fancy and requirements. The setting on of the tail is a characteristic in the oldest; the removal of this defect will be a valuable achievement when accomplished. The superiority of the Pollies and Highlanders over most other breeds consists in the excellent quality of their beef and the high percentage of dead to live weight. As a rule the meat is well marbled, often a greater proportion of compact, finely-grained flesh, with less coarse fat than many other breeds. Some people will place the Devons before them. I consider it in no way inferior. Both these breeds with skillful care have greater things to look forward to.

Amongst those who are not thoroughly conversant with the Aberdeens an idea exists that they are slow feeders as well as being slow at arriving at maturity. There is little doubt that such was the case. Now, however, it has been so greatly improved in that respect that it matures almost as soon as some of the leading breeds, and if well fed from birth the best specimens become ripe at the age of from twenty-eight to thirty months. This breed is remarkable for retaining loveliness of form during the fattening process, and in cases of excessive feeding they rarely become patchy or disproportioned. Since the rage for young beef became so strong, many have been fed for the butchers at thirty months old, where they have realized from £25 to £35. Many fully-matured bullocks will fetch at the London Christmas market £40 to £48 each. The breed cannot now be distinguished for its milking properties; formerly it was held in high estimation for dairy purposes. The main aim of the improvers has been the development of its beef-producing qualities to the deterioration of the flow of milk; and now they are actually deficient in this respect, but with a little attention their ancient reputation can be restored. A few families are excellent milkers; these are becoming more highly esteemed than they were a few years ago. This breed, as well as the Galloway, are finding favor with English breeders, and many herds are already formed in England, also in Ireland. In Scotland itself this breed is extending its territory. More than a hundred herds are now established there. Of the Polled Herd-Book, published in 1862, six volumes have been issued, and in the last the names of 119 breeders appear. There have now been registered 1,930 bulls, 5,054 cows and heifers. The herd-book is now conducted by a society formed in 1869, on similar principles to the Shorthorn Herd-Book. One of our great improvers of the breed was Mr. Hugh Watson, followed by Mr. McCombie, Tillifour, whose remarkable show-yard achievements, both in fat and breeding stock, have been instrumental in bringing their true merits before the public. The deservedly high reputation the Aberdeens have gained is mainly due to the indefatigable exertions in the promotion of the breed by that popular breeder, whose judgment is entitled to the highest respect. In Mr. McCombie's early days he laid a firm foundation, to which the most noted animals of the present day are closely allied. He purchased the mother of the Prides for the sum of £12 10*s*. in 1844, and at the dispersion of his herd, in 1880 10 Prides averaged each over £80 10*s*. One Pride, the fifth in descent from the £12 10*s*. animal, realized the handsome sum of £283 10*s*. At the present day they are most valuable and popular; their only real rivals are the Ericas, of Ballindalloch. McCombie's show-yard honors are unparalleled in farm-stock history. I firmly believe there is sufficient scope for judicious selections to be made from the Galloway ranks to obtain as great results as those achieved by those popular improvers of the Aberdeens. The Galloways are by no means pushed to the extent of substance and refinement to which they are capable of developing. Mr. McCombie's success in building the family of the Prides was in a very great measure due to his great judgment and care in the selection of bulls. The difference between the two breeds is, as might be expected, from different circumstances. The Galloway has a thicker skin, a stronger and better coat of hair, and more shaggy appearance than the Aberdeen. Admirers of each breed claim superiority, and on this point considerable difference of opinion exists.

The Aberdeen answers admirably to the indulgence it receives, and the Galloways do well on more humble fare; meritorious animals of both breeds have appeared in the show ring, and, from a butcher's point of view, neither breed has to yield to any other.

	Pounds.
Live weight:	
Four-year-old ox, at Smithfield show, December, 1883 (offal 8, pounds to the score)	2,375
Cow or heifer (offal, 8 pounds to the score)	1,883
Dead weight:	
Fully matured ox (average) ordinarily fed for market	720
Milk:	
Annual average	3,500
To pound of butter	24
To pound of cheese	10

Soil.—Clay, loam, and peat.
Climate.—Mean temperature, 47° 8′.
Color.—All black.

GALLOWAYS.

Galloways are by nature good milkers, but since the rage for young Scotch beef has sprung up in the London markets, the dairy properties have become a secondary consideration, and the pole-axe has taken precedence of the dairy. As beef producers they rank among the first quotation. At the international show held at Poissy in 1875, the Scotch Pollies were awarded the highest honor for the best live beef against all breeds, which honors were substantiated when dressed. This breed has been distinguished for hardiness and feeding properties for many generations. Their fine qualities are no longer hid under a bushel. Their reputation has spread far and wide, and a great and increasing demand has sprung up, both for home market and export. Being hornless and very docile they are admirably adapted for yard feeding, railway and ship transit.

They are reared upon thin, rocky, inferior land, in a most severe climate, especially in winter and spring, and their ready response to liberal treatment commends them to all who are engaged in agricultural pursuits. Notwithstanding their climate, the ordinary breeder affords no shelter beyond about three of the severe months, but nature has provided them with a thick, black waterproof of long, thick-set, silky hair, and strong mellow hides to protect the model carcass, and to fit them for the hardships they may have to endure in their native homes, while their more favored rivals, the Aberdeens, are often only exposed for a corresponding period in the summer. This practice has been established many years and is found to succeed well in Aberdeenshire, and all adjoining counties where artificial food can be abundantly produced. The winter food consists chiefly of straw and turnips on farms where they can be profitably produced.

It is fully believed that the Galloway can gain a year in maturity, give a third more milk, and a proportionate increase in beef under more favorable circumstances. The price at which selected animals can be purchased: Heifers, at two and three years old, from £25 to £35. Much larger prices are realized in many cases where fashion overrules judgment. By careful cultivation the general milking properties can be restored, and I have the authority of the principal of a large butter factory to state that the Galloway produces the richest milk of any other breed that contributes to the dairy, and is very regular in quantity which supports the remark that their robust constitution defies all ordinary disease; therefore few drawbacks are experienced.

The beef is spoken of in the sixteenth century as being right delicious and tender, which properties it retains in a high degree to the present day. The English graziers found out their good feeding properties soon after the union of the two crowns, and for upwards of one hundred and fifty years the trade has been extensive and is now brisker than ever.

The once-prevailing practice of spaying the heifers has been discontinued, and the heifers are now retained for breeding purposes to meet the growing demand, and give a more favorable opportunity of improving the breed by selection.

The Galloway cattle possess all the character and resemblance which constitutes a breed, yet they vary much in size and form according to the treatment they receive and the fertility of their ranges. Not supplying young growing stock with sufficient nutritious food, when bone and muscle are forming, is an erroneous practice, which many breeders have followed, when at the same time convinced of their error. These animals answer admirably to liberal treatment, and therefore must be adapted for countries where food is plentiful. I have always received highly satisfactory accounts of the progress made by them in foreign countries.

At the Smithfield show (London), the Scotch Pollies are all classed together as one breed. The weights under the head of Aberdeens is a little more than the Galloway.

	Pounds.
Average dead weight of a matured ox ordinarily fed for market	700
Milk:	
Annual average weight	3,000
To 1 pound of butter	22
To 1 pound of cheese	9

Soil.—Loam, clay and sandy.
Climate.—Mean temperature 49°.2.
Color.—All black. One of the oldest British breeds.

NORFOLK POLLS.

They are red in color and have figured at the Royal Agricultural Society's meetings for many years, and have gained many prizes in the class "for other established breeds," and were awarded the dignity of special prize at the royal show held at Battersea in 1862. Since then they have been gaining approbation, giving evidence, as they do, of good milking properties, as well as size and symmetry, and carrying a good proportion of lean meat to the fat. Considerable attention has been paid to the improvement of this breed, and it is becoming more noted for dairy productions. The soil, climate, and treatment are favorable to their cultivation and development of all their essential properties. They are the general dairy breed of their county, which is more a grain and grazing district than dairy.

The soil is alluvial, loam and sand, fertile, with a mild climate. They are an old breed, with short legs and thick bodies, supposed to be descended from the Galloway, with native admixture.

	Pounds.
Live weight:	
Four-year old ox at Smithfield show, December, 1883 (offal, 8 pounds to the score)	2,012
Cow or heifer	1,984
Dead weight:	
Ox fed in the ordinary way	700
Cow or heifer fed in the ordinary way	640

Color.—All red.
Climate.—Mean temperature, 49°.5.

WEST HIGHLANDER.

This wild and fierce looking mountain ranger, with its long, shaggy hair and gracefully set long horns, is a general favorite with every grazier in the Kingdom, of which it may be said "it never lost a friend or made an enemy." The great demand and keen competition for these really hardy and picturesque animals for grazing in all parts of England leaves a very small margin for profit. They are special favorites with many noblemen, and are selected for the profitable adornment of their parks. Many are slaughtered for the use of the castle or mansion, the beef being of the choicest quality, and they harmonize well with the deer, and are the ornament of the parks through all seasons, as house protection is unknown to them unless on special occasions, where showyard honors rule the ambition. I have seen them in their native homes and again seen the same animals shown in our southern markets before the railways were taken advantage of, fresh and vigorous after a drive of over 600 miles. Their inexhaustible staying powers are specially desirable to beef producers in distant countries where railway accommodation is not available. They mature at four years old; they are quick graziers, and produce the highest quality of beef. They average between 480 pounds and 600 pounds dead weight, according to keep, &c., but can be brought to much greater weight by artificial food and treatment. They have been bred in vast numbers in the bleak and romantic isles and highlands of Western Scotland from time immemorial and still retain their high reputation to the fullest extent for all the above properties. The grazier may not realize a very great profit for the outlay, as the never-failing demand keeps up the price, but profit is very certain as there is always a corresponding demand when fat, and they require very little attention, being grass fed; and they are free from ailments. In their mountain homes they are of a wild nature, but soon yield to domestication, when they become very docile on receiving kind treatment. They give rich milk and a fair quantity, but from their high and profitable feeding qualities they are not used in regular dairies, but supply home consumption and cottagers (cotters). When prepared for our fat shows they scale great weights. Their long coats of hair, formidable horns, and general wild appearance, render them very attractive objects and add great interest to the exhibition. These animals cross well with the Shorthorn bull as well as the Galloway. The produce, invariably surpassing the dam in weight, are well-formed and often combine in a greater degree the milking and feeding properties. Argyleshire is the stronghold of Scots. The breed is not, however, confined to that county, but extends to the rugged heathery hills surrounding, where scarcely any other kinds of cattle can exist.

	Pounds.
Live weight:	
Fully matured ox, at Smithfield show, December, 1883 (offal, less than 8 pounds to the score)	2,090
Cow or heifer at Smithfield show, December, 1883	1,486
Dead weight:	
Fully matured (average) steer when fed for market on grass	600
Heifers when fed for market on grass	520
Milk:	
Annual average	2,500-3,000
To 1 pound of butter	22
To 1 pound of cheese	9

Soil.—Light loam, clay, and granite.
Climate.—Mean temperature, 48° 4′.
Color.—Red, black, and dun.

THE SUSSEX.

The Sussex are now ranking among the improved breeds, and possess all the essential character of the Devons, but resemble more the South than the North Devons, being larger in size and coarser in form. The breed may not have been so strictly kept from foreign admixture of blood, yet it exhibits as great a uniformity of character as any other breed. They exhibit a slightly nervous temperament, and are not very heavy milkers, but are good grazers, and, when fully matured, attain considerable weight. They require four years before they reach full maturity. This breed has its warm admirers as well as prejudiced opponents; it may not have obtained that public favor to cause its introduction into other parts of the country. This is not from any inferiority of the breed, but because the same attention has not been employed in calling forth the properties most generally valued in any breed of cattle. It is not until comparatively a recent date that the promoters of this breed have set to work in good earnest to remove defects and supply symmetry, quality, and early maturity. Those efforts have been wonderfully successful. The show of reds at the royal agricultural meeting, held in York, in July last, far surpassed any former show for quality, refined improvement, and development of important parts. Sussex being chiefly arable land, the work was formerly done both by bullocks and heifers, for which work they are admirably adapted, combining as they do weight of body with muscular activity. They are still used in the stiff soils of the weald. From four to eight are worked together, commencing at three years and worked until five or six, when they are fattened for the butcher. The distinctive color is red, but of a less florid shade than the North Devon. They have long, but not coarse horns; the hair and handling is not equal to that of the Devon, but they feed to greater weights at equal ages. They are tolerably good milkers, but are not eagerly sought after for regular dairies. Their general appearance indicates that if means were used to improve them in the degree to which they are susceptible, and by judicious attention to the selection of parents to improve the progeny, they are capable of developing into good dairy and beef producers and become valuable for exportation as the foundation for a breed that is likely to be molded to the taste and requirements of future breeders and to soil and climate.

	Pounds.
Live weight:	
Of four-year old ox at Smithfield, 1883 (offal over 8 pounds to the score).	2,241
Weight of heifer (Smithfield, 1883)	1,890
Weight of cow, any age	2,245
Dead weight:	
Fully matured ox, ordinary, fed for market	840
Heifer, fed for market	720
Cow, fed for market	800
Milk:	
Annual average	4,000
To 1 pound of butter	24
To 1 pound of cheese	11

Soil.—Clay, loam, sandy.
Climate.—Mean temperature 50°.
Color.—All red.

WELSH CATTLE OR RUNTS.

The great improvements that have been made in this breed has brought it into prominent notice by graziers. This breed was a medium-sized mountain beast, but has now pushed to the front, and at the great Smithfield show held in London has scaled the heaviest weight of any bullock in the hall. The breed possess many of the West Highlanders properties, but lacks the hair and the picturesquely fierce appearance of those shaggy inhabiters of the Scotch hills. The Welsh give rich milk, and are extending their limits, but they are not likely to supersede the fine existing breeds or modify the character of many by admixture. They would answer well for export where hardihood is very essential and refinement not of importance. They are natives of the hilly country, where their food is the rough herbage of the mountain, where the cattle are in a corresponding degree small, but coarse and robust, and somewhat slow at arriving at maturity.

In the vale, where better natural and artificial food is plentiful, they make a greater size and answer well to treatment. It may have been a sufficient length of time distinct and uniform to constitute a well-defined breed, and a good butcher beast, but wanting in style and grandeur.

	Pounds.
Live weight:	
Of four-year old ox at Smithfield December, 1883	2,498
Cow or heifer (offal 9 pounds to the score)	2,214
Dead weight:	
Average of fully matured ox, ordinary feeding	800
Milk:	
Annual average	3,000
To 1 pound butter	24
To 1 pound of cheese	10

Soil.—Slaty clay.
Climate.—Mean temperature, 49°.5.
Color.—All black, with strong horns.
An old breed. The improvement of modern date.

THE LONGHORN.

The Longhorn a century ago held an eminent position among our British breeds of cattle in many of our northern English counties, and was liberally distributed over Erin's green isle. They have long been on the wane, and their reputation, which had given Bakewell, the originator of the breed, years of anxious study, has passed away more rapidly than acquired; given way to animals possessing earlier maturity, milking and grazing properties in a greater degree than the once popular Long-horn.

Some spirited efforts have been made for years past by enterprising men and ardent admirers of this once-famed breed to restore them to public notice and patronage, and the result is that some splendid individual specimens are brought forward at our great meetings. The Royal Agricultural Society of England and Christmas shows encourage the breed by offering prizes for them, and they certainly attract more than an average share of attention from young farmers and sight-seers. The ponderous horns and peculiar and uncommon color, white streak down the back, a broader one on the belly, with dingy gray or mixed brown and white center pieces, and clothed with water-dog hair, render them very attractive. They give very rich milk, and formerly were good dairy cows. They attain considerable weight when fully matured, which takes at least four years. The beef is very firm and good, but not evenly distributed, and is wrapped in a thick valuable hide. They possess a strong, hardy constitution, and although confined in narrow limits, it is to be hoped those energetic patrons of the old breed may be successful in their efforts to reinstate them in all their former glories, with such modifications and improvements as will render it worthy of public notice and more extensive patronage.

Many of Mr. Bakewell's followers succeeded well with the breed by continually hiring bulls from Mr. Bakewell. One of the earliest and most distinguished adherents was Mr. Fowler, near Oxford, whose herd was sold off in the year 1791, when the following prices were realized, viz: Bull, five years old, was sold for £215; bull, two years old, for £220.10; bull, one year old, £210; bull, aged, for £215. Four cows realized £215, £273, £120, and £195, respectively.

	Pounds
Average dead weight of steer, four years old	800
Average dead weight of heifer, four years old	720
Average dead weight of cow, aged	800
Milk:	
Annual yield	3,000
To pound of butter	22
To pound of cheese	9

Soil.—Deep loam on limestone.
Climate.—Mean temperature, 49°.6.

THE AYRSHIRE.

The Ayrshire ranks amongst the best cattle for dairy purposes. It has few equals, but it is not held in high estimation as a beef beast, being small and not that kindly animal that graziers like to meet with; still they are good feeders when dry. They have an extensive circle of admirers in their own native home and surrounding counties. They are a hardy race, and are bred exclusively for dairy uses. Their Ayrshire home on the Clyde and near the Irish sea consists of moorland, hills, and in some parts undulating surface of common clay; the hills are light, rocky, with poor herbage. The narrow valleys have sweeter food. Towards the sea there are great belts of barren sand. The climate is moist and the district greatly exposed to continued winds and humid vapors from the Atlantic. There are a few tracts of useful land, but throughout the fertility is very moderate. The Ayrshires at one time were used in our London dairies, but have been relinquished in favor of the Yorkshire or Teeswater Shorthorn. They did not come to the weight and condition after failing to be profitable for milk, and, therefore, are supplanted by animals better adapted to the system of milking and feeding simultaneously. Although the Ayrshires are very valuable dairy stock in their native homes, and it is not satisfactorily settled as to whether they do not pay best on medium and poor herbage, in some cases it has been found that when transported to genial soil and climate they begin to lay on flesh and do not increase in milk in a corresponding degree. Although of long standing, it was late in being prominently brought before the public as a defined breed, and the high qualities possessed thereby are due to the admixture of Teeswater and Jersey blood which has been introduced to their country. The great similarity existing between the Jersey breed and the Ayrshire is in the color of skin, horns, and dairy properties. The general resemblance of form is so great that a Jersey cow might easily be mistaken for an Ayrshire. The bull calves of this breed are mostly sold for veal. No breed receives more attention than this does by its admirers to keep intact and type all its properties. These animals carry the neatest bag and best formed teats of any breed. They do not carry a brilliant color, being a dingy red and white. When dry they feed well. Their greatest drawback is want of substance for general purposes, but there is no just reason why this breed cannot be greatly improved and all defects removed.

	Pounds.
Dead weight of matured heifer or cow fed in the ordinary way for market..	560
Milk: Annual average weight	6,000
To 1 pound of butter	22
To 1 pound of cheese	9

Soil.—Loam, clay and sand.
Climate.—Mean temperature, 48°.8.
Color.—Dingy red and white.
An old established dairy breed of Teeswater and Jersey mixture.

THE JERSEY.

The Jersey is distinguished as producing rich milk, fine colored and delicate flavored butter, for which luxury they are often kept as lady-pets in private families, but are only partially used in regular dairies to give a little coloring to the dairy products. They are to be found throughout the United Kingdom for the same purpose. Color pale red and white, but the smoke or silver-gray color is preferred; skin of orange-yellow, which is an indication of rich milk; small sized and of delicate constitution. They are not prepossessing in form, and are awkward of gait, but very docile. The surplus bull calves are fed for veal; the heifers are kept for the dairy and breeding purposes. Therefore, little can be said for the beef. Any improvement that may arise from crossing will be due to the new infusion. It would take many generations of careful culture to permanently unite and establish those essential properties in such a degree as to commend them to the public as profitable beef and butter machines. They are more fitted for amateur farmers and opulent families, than for ordinary dairy purposes, as when they have done milking there is little to carry to the reserve fund. The prices vary more from fancy than intrinsic value, ranging from £20 to £30 for good animals, but three times that amount has been paid for them when sold at auction, and over £100 frequently for very choice specimens. They will no doubt answer all reasonable requirements if exported to genial soils and climates.

They are regular breeders and will continue to be so to a good old age, but as a natural consequence will fail to retain the quantity and quality of milk as if young and in full vigor.

Annual average of milk, 4,880 pounds; 17 to 20 pounds of milk to 1 pound of butter; quantity of milk to cheese, not known; average live weight at four years old, 896 pounds.

RÉSUMÉ—ANALYTICAL COMPARISONS.

Meat producers.—As to the profitable size of an animal, there is a great difference of opinion amongst men whose judgment and experience entitle them to great respect. Every man has his favorite breed and this in their eyes is the only breed worthy of cultivation. But we must bear the great fact in mind that the profit of breeder and feeder depends not so much upon what the animals make as what it costs making. The Hereford not infrequently pays the grazier better than the Shorthorn, but the value of a breed is not to be determined by the profit it yields between buying and selling, but by that which it yields to the breeder and feeder conjointly from its birth to maturity. The great objections raised against the Devons is said to be their diminutive size. Now, there are many specimens of the Devon breed that have scaled great weights. Mr. Hancock, of Hales, had a bullock in 1873 whose live weight was nearly 2,788 pounds, and which yielded 1,780 pounds of beef. This animal was five years old and had been worked on the farm. A well-known breeder, Mr. Hatway, had an animal of the Devon breed which weighed 1,700 pounds dead weight. There are many other individual animals which have reached extraordinary weight. Mr. Samuel Kinder's champion ox weighed alive 2,128 pounds, and gave a carcass of beef weighing 1,500 pounds. At the Smithfield Club show, in 1875, Mr. Richard Warner's cow weighed alive 2,036 pounds. These weights leave great hopes of further development in size of the general breed. Although these are extreme cases, of which many more can be referred to, they may suffice to hold out great encouragement to a beginner to make selections possessing qualities and capabilities calculated to remove the North Devons from the stigma of pigmy animals. Their dairy properties may not rank with the first, but they possess that tendency to dairy productions that give every encouragement for great improvement in that important branch by judicious selections and careful treatment.

The very best beef-producing animal in existence is the cross between the Scotch Pollies and the pure bred Shorthorn bull. This system of crossing is extensively practiced in Scotland. Ninety per cent. of the Aberdeenshire beef, so highly prized in the London market, is a cross between these two breeds. At the Smithfield Club show in London in 1880 the average increase in weight of six steers of Polled breed under three years of age was 1.78 pounds, and the corresponding class of Shorthorns show 1.79 pounds. The black Pollies will frequently realize at three years in the London Christmas fat-market from £25 to £40, and some choice specimens higher sums If the breed were distinguished for milking in the same degree, it would be one of the most valuable of our British breeds. The rise in this breed has within the past few years been remarkable. Good average cows will bring from £30 to £45, while better-bred familes and more popular will realize from £50 to £100 on an average; some fashionable tribes ranging from £120 to £270. The average of Mr. Adamson's sale in 1881 was as follows: Fifteen cows realized over £47 each; 10 heifers averaged £47; 9 calves over £20 each; 2 bulls averaged £118. The 36 animals averaged £56 11*s.* each.

London dairy tests.—The result of the London dairy scientific tests may show the qualifications of individual specimens, but I do not think that a reliable annual average, either of weight of milk, proportion of milk to butter, and milk to cheese, characteristic of any breed is recorded. In fact I do not think such a statement possible to be made, as good soil, climate, and other circumstances make great variations, even with the same animals. However carefully an experiment in such cases is conducted it can only apply individually, and is open to criticism and objections, and is not calculated to satisfactorily solve the question upon reliable information. The nearest approximation to the requirements will be gathered from general milking properties, where minute details which cannot have a general application must be taken into consideration.

In a very extensive milking dairy in Yorkshire, where every department is conducted on the best and most economical principles that experience can suggest, daily records of productions, &c., show that 2 gallons, or 20 pounds of milk per diem, through the year can be obtained from the selected dairy Shorthorns, inclusive of a few Ayrshire and Jerseys, and a couple of Galloway and Shorthorn crosses.

At the dairy show held in London, October 3, 1883, the following is the analyses of milk, with other data, on which the awards of prizes were made, which results only go to prove the foregone conclusion as to the best dairy cattle in the British Isles, the championship falling to the Shorthorns, as did also the second honor:

Breed.	Age.	Date of calving.	Day's milk.	Percentage of solids.	Per cent. of fat.	Total award.
	Ys. mos.		*Lbs. oz.*			*Percentage.*
Shorthorn	7 9	May 12	51	12.96	3.85	99.12
Do	5 6	Sept. 27	47	14.20	4.71	92.05
Short-horn and Dutch	7	July 10	60 4	12.12	2.86	91.59
Guernsey	7 2	Apr. 8	18 8	14.25	5.54	87.50
Jersey	5 4	Aug. 5	36 4	14.21	5.14	81.87
Devon	4 5	July 4	26 8	14.75	5.28	87.80
Ayrshire	4 6	Oct. 3	30 4	14.18	5.12	79.81

Weights by breeds.—In pursuance of the capabilities of the recognized breeds, I will give their live weights when at the highest state of perfection which skillful treatment can bring them to, and by which it will be seen that the combined properties of milking and grazing do not exist in all renowned breeds, although the winner of the champion dairy prize on the 3d of October is of the same breed as that which carried the first prize in the same hall in December, 1883, as best fat cow in her class, and weighing 2,352 pounds, the heaviest of all female exhibits, and, what is more worthy of remark, another Shorthorn heifer a little over two years old obtained the champion prize against all breeds, weight, or sex; her live weight being 2,049 pounds.

The following table shows the live weight of two of the heaviest animals in each class, but not necessarily all prize winners, as in many instances the prizes went to the lighter animals:

Breed.	Steers (not over 2 years).	Steers (not over 3 years).	Steers (not over 4 years).	Heifers under 4 years.	Cow, 4 years.
	Cwt. qr. lb.	*Cwt. qr. lb.*	*Cwt. qr. lb.*	*Cwt. qr. lb.*	*Cwt. qr. lb.*
Devons	10 2 10	14 1 4	17 2 6	14 1 4	17 1 4
	10 1 14	12 1 22	17 2 8	13 3 12	13 3 15
Herefords	14 0 22	17 0 24	18 2 6	18 3 37	20 3 5
	13 3 18	16 1 4	17 3 14	17 0 26	....
Shorthorns	13 3 4	19 0 27	19 3	18 1 5	21
	13 1 14	18 3 8	19 1 20	16 3 12	19 2 13
Sussex	13 2 25	17 3 24	20 1 1	17 3 2	20 0 5
	13 3	19 0 5	18 3 2	16 3 26	16 2 6
Red-Polled	15 1 20	17 3 6	17 2 4	....	....
	14 1	15 1 20	14 3 6	....	....
Scotch Polled	....	19 1 2	21 0 23	17 2 22	....
	....	18 1 10	19 0 22	14 1 10	....

Highlanders (any age): 19 cwt. 1 qr. 1 lb.; 17 cwt. 2 qrs. 18 lbs.; 14 cwt. 5 lbs.; and 13 cwt. 2 qrs. 10 lbs.

Welsh oxen (any age): 22 cwt. 1 qr. 6 lbs., and 19 cwt. 3 qrs. 2 lbs.

Special excellences.—After making special remarks on the merits and demerits of the various British breeds of cattle which are recognized by the Royal Agricultural Society of England and protected by herd-book records, there are incidents and freaks of nature which are in some degree calculated to mystify the opinions of the inexperienced. For instance, there is the enormous weight of the Devon oxen, which is not characteristic of the breed. The same thing occurs in Welsh Runts. The pure Devon is a small, compact, hardy animal, of fine quality, medium milker, of rich quality. The Hereford is of large size; good grazer; inferior in milk yield. The Shorthorn, great size, good grazer, superior milker. The Aberdeen, compact, with good size; good grazer and medium milker. The Galloway, slightly smaller than the Aberdeen, but very compact in form; medium milkers, of rich quality. The Highlander, small and compact; milk rich, and fair quantity for size, but not often used for dairy purposes; they are bred on the hills, run together and reared in the same manner as mountain sheep; their beef is of the finest quality. The Ayrshire, small-sized, bred for dairy purposes, in which they excel; good grazers, but, as very few steers are kept, little is said about the quality or weight of beef. The Jersey, small, deer-like; gives rich milk and fine quality of butter; no pretensions to beef-producing. The Welsh, useful dairy animals; over medium size; milk, rich; vary according to food and treatment; not so rich and graceful in general appearance, but a good, sound, hardy animal. The Sussex, great size, fair milkers, good grazers; for this breed there are great hopes of further distinction. The Longhorn, large frame, hardy, and good grazers; formerly good butter and cheese producers. The Norfolk Pollie, thick, chubby animals; good dairy cows and grazers, but do not possess that graceful figure that characterizes the Northern Pollies; it seems to be fighting its way to greater popularity; some attention has been paid to them by foreign buyers. The Guernsey belongs to the same group of islands as the Jerseys, and possesses the same dairy properties, giving a little more milk, and is heavier in carcass, but plainer in form.

CONCLUDING RECOMMENDATIONS.

Before concluding, it may not be deemed inexpedient to introduce a few qualifying remarks that may not produce any detracting influence, but have a tendency to establish confidence in my experience and humble endeavors to give a correct and unbiased description of the capabilities of the various breeds of cattle referred to in this report. For many years I had the entire management of the extensive and distinguished herd of Shorthorns belonging to the late Earl of Ducie, Gloucestershire, as well as the Herefords, Scots, and Jerseys, which were kept more as experimental auxiliaries than for the permanent establishment of the breeds. I established a considerable herd of selected Shorthorn cattle for Napoleon III, and although they were located in the two extreme temperatures, they answered admirably, and just as their influence was beginning to be felt in France their further development and usefulness were suddenly cut short by the unfortunate Franco-Prussian war. I also formed, and for many years superintended, the well-known herd of Shorthorns belonging to Colonel Gunter, in addition to Galloways and other smaller herds of different breeds, and have acted on nearly three hundred occasions as judge of stock at agricultural societies in the United Kingdom. My remarks, therefore, as far as possible, are founded on facts obtained by long experience, and I am actuated by no motive or interest beyond a desire to submit this report with as much truth and as few errors as my abilities will allow.

I have for forty years given my undivided attention to breeding and feeding of nearly every description and breed, during which time I have shipped to all quarters where British breeds are to be found, and have had more than ordinary opportunities afforded of acquiring a thorough practical knowledge of the true merits of the various breeds. I have always found the Shorthorn, Hereford, Devon, and Scotch Pollies answer admirably when exported to Australia, New Zealand, South America, the United States, and Canada. I entertain a very high opinion of the Sussex cattle for exportation. There are many other English breeds, but I think I have named the animals best adapted for other climates. The Norfolk Pollies answer well with liberal keep, but cannot rough it with the Scots. The Highlanders, on account of their wildness, have not often been tried, but they can easily be subdued and brought to be very gentle.

The full details of the properties of our best British breeds of cattle are embodied in the separate reports under the different heads, which facts strongly support my confident recommendation of the following breeds as the best adapted for exportation to the United States and Canada, viz, Shorthorns, Herefords, Devons, Galloways, Aberdeens, and Sussex. These animals possess strong, robust constitutions, and other essential properties abundantly fit them to fully maintain their reputation when suitably located, and every breed named is capable of further development under circumstances more favorable to their varied habits. The Scotch Pollies can stand severe climates with inferior food, and the heavier cattle will freely respond to the rich fare of the plains. Where milk and butter are made specialties the Jersey and Ayrshire are invaluable. The West Highlander, if once located in the United States, would gain friends where the climate did not necessitate the winter housing. The Longhorns are very ungainly, both by rail and ship, owing to their ponderous horns.

PRICES OF BRITISH CATTLE FOR EXPORT.

The prices at which really good formed animals ought to be purchased will vary a little according to age and other circumstances.

The subjoined list contains the prices at which genuine good animals of the different breeds can be obtained:

Shorthorn cow or heifer, with pedigree	£35	to	£50
Hereford cow or heifer, with pedigree	35		50
Devon cow or heifer, with pedigree	30		45
Galloway cow or heifer, with pedigree	25		40
Aberdeen cow or heifer, with pedigree	30		45
Ayrshire cow or heifer, with pedigree	20		35
Sussex cow or heifer, with pedigree	30		40
Norfolk cow or heifer, with pedigree	30		40
Jersey cow or heifer, with pedigree	20		30
Welsh cow or heifer, with pedigree	20		30
Longhorn cow or heifer, with pedigree	30		

If noted blood and renowned fame are required, higher prices would have to be paid; and all breeds have favorite families and lines of blood which do not in all cases arise from any greater excellence they possess.

HOW TO SELECT CATTLE FOR EXPORT.

In selecting animals for export a saving of 20 per cent. can be effected by knowing the breeders as well as the breed, and devoting sufficient time for due examination. Limited time and hurried selections is often followed by disappointment to the purchaser, and throws discredit upon the breed when landed on foreign shores. I think it quite practicable to purchase half a dozen choice specimens of each breed with authenticated pedigrees, including young bulls to match, and delivered in New York free of all charges for the sum of £50 each. Liverpool to New York or Portland is the best route. Passage of cattle, including food and water, £6 per head; insurance from 10 to 12 per cent., according to the season of the year and vessel employed. The charge for man to attend upon them is regulated by the number of cattle shipped.

JOSEPH LAY FAULKNER, M. R. C. V. S. L.,
Veterinary Surgeon.

SOUTH MILFORD, COUNTY OF YORK,
West Riding, England, January 3, 1884.

JERSEY CATTLE.

REPORT BY CONSULAR AGENT RENOUF, OF JERSEY.

The breed of horned cattle in the island has long been known, and is in many respects remarkable. The important peculiarities are the small size and delicate frame of the animals, the large quantity and rich quality of the milk they yield, and the yellowness of the fat, and of the butter made from the milk. The first result may, no doubt, have been produced by the habit of breeding in and in, which has long since been carried to such an extent that each island has its own breed, which may not be mixed on any consideration whatever. Perhaps the same cause combined with the practice of tethering, the pampering with various kinds of food, and the climate may be sufficient to account for the other peculiarities also. Although very small, many of the cows are remarkable for symmetry, and they rarely show vicious temper. They have a fine curved taper horn, a slender nose, a fine shin, and deer-like form. Of the different island breeds the Alderney is the smallest and most delicate, and the Jersey is somewhat larger, but not very different. The Guernsey cattle are larger boned, taller, and stouter in all respects, and have a less fine coat. The color of the coat is very various, being commonly red, red and white, gray and white, or cream colored, but there are good beasts of black, and black and white color, with a dingy ridge down the back. All the cattle are yellow round the eyes, and within the ears, and this peculiar tendency, it has been already remarked, is accompanied by a similar color of the butter made from their milk, and of their fat when killed. The cause of this peculiarity of color has been an object of much unlearned and learned speculation. It is evident that the milk is not the only secretion of a yellow color, for in addition to the eyes and ears being tinted, it is one of the peculiarities of the best animals that there is a yellow tinge at the root of the tail. It has been suggested that the color is derived from bile, but yellowness is not the essential character of that secretion. Its properties are to be bitter, carbonized, and to perform certain functions in the animal economy. Colorless bile is possible, and so, beyond a doubt, is yellowness without bile. But that the coloring matter of the milk and tissues of the Channel Islands cow may also be the coloring matter of the bile is an hypothesis which no physiologist would condemn, so is the doctrine that the near vicinity of the sea may supply an excess of soda in the grass, and that the practice of closely tethering, by limiting the amount of exercise, may engender a tendency to something akin to bile, if not bile itself, to be in excess. The large yield of milk from the island cows and the richness of the milk for butter are well known. Extreme cases show that from 16 to 17 pounds per week of butter have been made from the milk of one cow. The cattle are fed in the ordinary way, and milked three times a day. Each cow requires about 1¾ English acres of grass land, and is fed during winter, from the beginning of November, on mangel-wurzel, turnips, parsnips, and hay. Good cheese can be made from the milk, but it is not manufactured for sale.

THOMAS RENOUF,
Consular Agent.

UNITED STATES CONSULAR AGENCY,
Jersey, *February* 20, 1885.

*Products of Jersey cattle.**

[Inclosure in Consular Agent Renouf's report.]

Name of breed: Jerseys; annual average pounds of milk: 2,400; milk to pounds of cheese: not made, milk being too rich; name of country: Jersey, Channel Islands; size at maturity: cow: length, 7 feet; girth, 6 feet; height, 4 feet 2 inches; bull: length, 7 feet; girth, 6 feet 10 inches; height, 4 feet 6 inches; live weight of cow: 1,000 pounds; live weight of bull: 1,200 pounds; age at maturity: 3 to 3½ years; weight of meat at maturity: bull, 800 pounds; cow, 580 pounds; origin of breed: Jersey, no animals being allowed to be imported except for slaughtering purposes, so that the breed is kept pure; few cows are slaughtered at maturity or in condition; if barren they do not feed well, and when in milk difficult to fatten, owing to their great yeld of milk; the average price of butter is 1*s.* 3*d.* per pound.

Topography: Altitude, 139 feet above sea level; mean temperature, 51° 9′; maximum, 87° 7′; minimum, 21° 3′; soil: loam, clay, sand, and gravel.

---

*The Jersey pound is 8⅛ per cent. heavier than the English pound.

Substratum: According to locality, granite, clay, and red gravel. Cultivated grasses: Timothy and lucerne in small quantities, about one-third to two-thirds clover, rye-grass.

Methods of housing.—Well appointed and warm stables with good straw litter in winter. In summer they are left in the fields except in bad weather.

Feeding.—From spring to autumn they are tethered in the fields to rye-grass and clover; in winter they are fed on hay, turnips, mangel-wurzel, and parsnips.

Handling products.—The milk is kept in clean dairies, and churning is done twice a week; no cheese is made when cows are in full milk; they are milked three times daily.

CATTLE IN CORNWALL.

REPORT BY CONSUL FOX, OF PLYMOUTH.

In answer to Department circular, I beg to state that I employed special agents, who were considered most likely to be able to procure information as to breeding cattle, but regret to add that, except in two instances, they have been altogether unsuccessful in their efforts. They report that there exists, on the part of farmers generally in this district, either a reluctance to afford information on the subject, or a want of sufficient data to enable them to give the desired particulars with such accuracy as would make them desirable.

I inclose form, which contains particulars obtained from a large breeder, and copy of a letter from a large farmer, who replied to the application made to him, not in the form attached to the circular, but by general remarks, in the form of a letter.

HOWARD FOX,
Consul.

UNITED STATES CONSULATE,
Plymouth, July 25, 1884.

SPECIAL STATISTICS CONCERNING CATTLE IN CORNWALL.

[Supplied by Mr. T. Hosken, of Loggens, Hoyle, Cornwall.]

Breed: Shorthorn.

Milk: Keeps no account of milk, cattle being reared for breeding purposes, and usually sold at two years old. Dairymen pay attention to milking qualities in breeding.

Live weight: At maturity: cow, 12 cwt.; bull, 26 cwt.

Topography: Altitude: 200 feet above the level of the sea. Temperature: mean, 50.5; summer, 56.2; winter, 41. Soil: Top soil a sandy loam.

Substratum: Sandstone, marl, and clay, with spar. Dexter granite and clay slate.

Cultivated grasses: Timothy, red and white clover, rye, and cocksfoot.

Housing: Store cattle in open boxes; turned out every day for exercise except in very severe weather. Feeding cattle, in close houses well ventilated.

Feeding: Fed on roots, hay, chaff, and a little meal.

Mr. Joel Rowe, farmer, to Mr. Cock.

[Inclosure in Consul Fox's report.]

GARE LAMORRAN, *November* 20, 1883.

I have been looking over the paper (tabulated form) you sent me, and I am very sorry that I am not able to fill it up, as I would take a good bit of trouble for Mr. Fox.

I have no idea as to the amount of milk a cow would give in a year. It would depend on the breed and the size of the cow. Jersey or Guernsey would be the richest milk, and the most and best butter, according to the milk, but I think a cross-breed cow would produce more in the year, being a larger bullock, and would come to the butcher with more weight when finished.

I can only refer to our own county. The climate varies so much at the same altitude that we must study our own particular farms as to what breed we ought to keep, and I presume it would be the same in America. Shorthorns will not do at all in the north of our county because it is so bleak and cold. Their bowels are so lax they become thin and poor, but here in the south, on the best and most sheltered land, they do very well. But I believe the Devons and Herefords are the most profitable for feeding purposes, having less bone and more beef in their best cuts, and being more hardy. They can bear the frequent changes of weather better than the Shorthorns. They are not so lax in their bowels, and do not require so much nor such good food. I should think the bullocks of Cornwall paid the farmers from £5 to £6 per head per year, without corn or artificial food, but of course the milking cows pay more. Then the cost of labor would be more.

I am, &c.,

JOEL ROWE.

CATTLE IN SCOTLAND.

REPORT BY CONSUL WELLS, OF DUNDEE.

In submitting herewith a "Report on breeding cattle," I have to state that I have consulted many of the leading cattle breeders of high standing in this district, inspected several herds, and procured all the information within my reach in relation to the subject. I have secured photographs of representative animals of the several breeds, and given a short history of them. The photographs will be found to convey a more accurate description of the animals than cuts or lithographs. I am under obligation to William Smith, esq., of Benholm Castle, Kincardineshire, for the information he gave me regarding dead and live weight of stock and kindred matters; also to J. W. Barclay, esq., member of Parliament for Forfarshire, Scotland, who is a practical farmer, owning a considerable herd of pure Polled Angus cattle on his farm at Auchlapan, Aberdeenshire, and is chairman of the Arkansas Valley Land and Cattle Company, which has a herd of 25,000 head in Colorado. He has recently visited this ranch and there introduced Polled Angus and Galloway bulls. Mr. Barclay is a recognized authority on cattle breeding and agricultural matters, and accordingly he has favored me with information relative to "the best animals to export to the United States," "the purchasing price of the animals," and "the best means of increasing the exports of meat to this country from the United States." To Thomas Ferguson, esq., of Kinochtry, near Coupar Angus, and others I am particularly obligated for valuable information regarding the Polled Angus and other breeds of cattle within this district. Mr. Ferguson has been a contributor to various agricultural papers in Great Britain and America, and has received prizes for reports and essays on agricultural subjects, and was the first to direct the attention of American stock breeders to the superior merits of the Polled Angus cattle. He has made the breeding of cattle a specialty for the last forty-five years, and has now one of the finest herds of Polled Angus cattle in Scotland.

The different breeds of cattle in this district are the Polled Angus, Shorthorns, Ayrshire, West Highland, and Polled Galloway. A very small number in the aggregate of the Alderneys and Jerseys are to be found in the parks of noblemen, but the five breeds mentioned, with their crosses, undoubtedly constitute the staple cattle in this district.

THE POLLED ABERDEEN OR ANGUS BREED.

The farmers of Aberdeenshire, it is stated, have done much to improve this breed and to make its beef famous in the southern markets. The number of this breed of cattle in Aberdeenshire is said to be greater than in all the rest of Scotland, and that district produced the man that obtained the largest number of prizes awarded to any one man for excellence in this breed, viz, the late Mr. William McCombie, of Tillyfour.

In Aberdeenshire there are many celebrated breeders of this stock. Among the prominent ones may be mentioned Mr. G. Wilken, of Waterside, of Forbes, who owns an extensive herd, and who has sent nearly 1,000 head of these cattle to the United States and Canada within recent years. It has just been publicly stated in the Scotch newspapers that this gentleman has been offered and refused $50,000 from America for the privilege of picking a hundred head from his valuable herd of this breed. The following lithographs show specimens of the breed from Mr. Wilken's herd.

This breed ranks as one of the highest, if not the highest, of beef, producing cattle in Scotland, and are called Polled Angus for the reason that they are without horns (polled), and were first raised and bred in the territory called Angus, which lies along the base of the Grampian Hills, embracing the Strathmore Valley, and extending north nearly to Aberdeen. These ancient cattle remained in their native state from time almost immemorial until comparatively recent date. They were originally of all colors and shapes. In the year 1808, the late Mr. Hugh Watson, of Keillor, near Coupar Angus, whose herd had been owned by his ancesters for hundreds of years, began to try to effect some improvement in the meat-producing capacity of his cattle, and his efforts were crowned with remarkable success. Mr. Thomas Ferguson also inherited a herd of cattle from his father, whose "Doddies" (as these cattle were called) had been closely bred for generations without any change of sires, only the calf from the best cow being retained as a bull. In 1839 Mr. Ferguson purchased some heifers from Mr. Watson, and in years subsequently some more bulls and heifers, and finding them so much superior to those he received from his father, he immediately commenced breeding the Keillor cattle, and from that time till now has made the breeding of Polled Angus cattle a business. He adopted what is called the "in and in" line of breeding for more than thirty years, rarely going outside of his own stock for fresh blood, and it is by this system that he attributes his success as a breeder.

I visited this gentleman's farm, called Kinnochtry, situated in the beautiful and fertile valley of Strathmore. His home farm comprises 420 acres, for which he pays a yearly rental of $8 per acre. In addition to this rental he is at great expense for artificial fertilizers, stocking his farm, paying servants' wages, &c., yet he has made stock-raising profitable, and he informed me that he realized this year from his cattle alone over $20,000. He has a herd of over 100 head of very fine pedigreed Polled Angus cattle, consisting of 2 stud of bulls, 41 cows, and the remainder calves and yearlings. He stated that he had just sold 20 bull-calves to Mr. George Whitfield, of the Government model farm, Canada, for $300 each.

The beef of the Polled Angus cattle is of a superior kind; it gives a very high percentage of dead meat to live weight; in butcher's phrase, "it dies well and cuts up" admirably. The cattle are in general form lengthy, deep, wide, and even-proportioned, and are docile in disposition, easily kept, and come to maturity early. They are hardy and rigorous, and can adapt themselves to most all climates. They are uniformly black in color. When well fed they mature at from 24 to 28 months. The average weight of 2½-year-old steers is about 1,000 pounds dead weight, and will bring in the Scotch and English markets from $150 to $200 each. They are more particularly distinguished as beef producers than for being suitable for the dairy, being only fairly good as milkers. They are bred and raised extensively in the northeast of Scotland.

Mr. Barclay, member of Parliament for Forfarshire; Mr. John Hanny, of Gavenwood, Banff; Mr. Hume, near Brechir; Mr. T. M. Nicoll, of Littleton, Kirriemuir, and several others have paid great attention to the breeding of Polled Angus, and have now excellent herds of these cattle.

The bull shown in lithograph No. 1 is Prince of the Realm, bred by Mr. Ferguson at Kinochtry, now the property of Mr. John Hannay, of Gavenwood, Banff, Scotland. This bull while in the possession of the breeder gained a first prize at the Highland Society's show at Kelso in 1880, as a two-year-old, and the first prize at the same society's show at Glasgow in 1882, besides a number of champion prizes in minor shows. At Glasgow, at the age of four years and fourteen days, he weighed 2,600 pounds, with a heart girth of 8 feet 5 inches. Since he passed into Mr. Hannay's possession he has gained other prizes and champion plates. He has been spoken of as one of the best Polled Angus bulls which has been seen for years.

THE POLLED GALLOWAY BREED.

This breed is black and polled like the Angus, but in disposition and maturing properties it more resembles the West Highlander.

The Galloways may be described as the cattle of the Southern Highlands, while the West Highland cattle occupy the northern Highlands of Scotland.

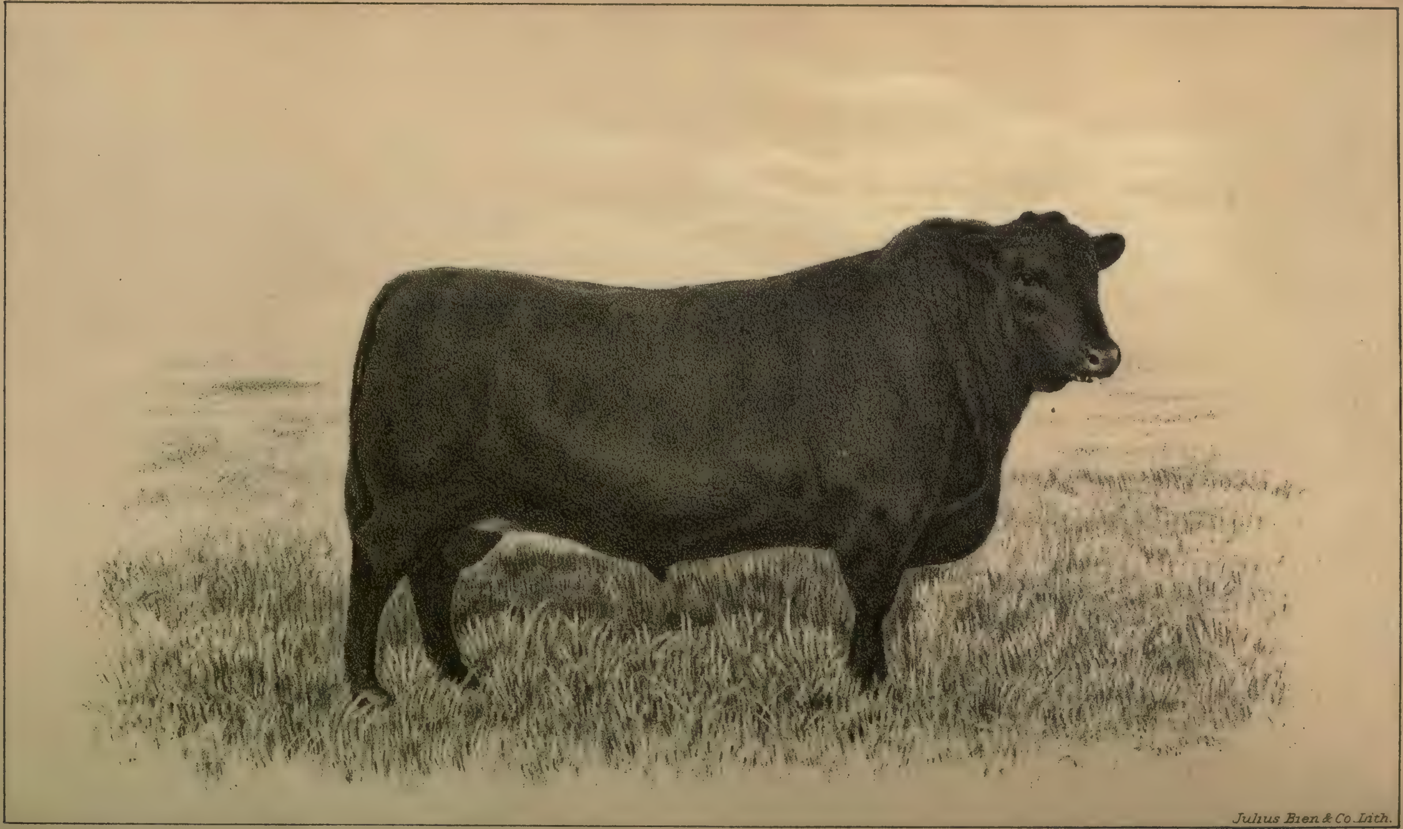
The following interesting report on Polled Galloway cattle was prepared for me by the council of the Galloway Society of Great Britain:

POLLED GALLOWAY BREED.

[Report prepared by the council of the Galloway Cattle Society of Great Britain for Consul Wells, of Dundee.]

This breed of polled cattle took its name from the province of Galloway, which now comprises the two southwestern counties of Scotland. Pedigreed herds of this breed are principally kept in Galloway and Dumfries-shire, in Scotland and in Cumberland, the most northwesterly county of England. The origin of the Galloways is lost in the mist of antiquity. An allegation has never been made in any well-informed quarter that they are not an original and distinct breed of cattle. From time immemorial they have been polled or hornless. There is a tradition mentioned by some writers that in remote ages they were provided with horns, but it is nothing more than a tradition, for in the earliest notices of the breed, centuries ago, there is no allusion made to there being horned. So emphatically are they a hornless breed that it is a certain mark of an animal not being a pure Galloway if it has the smallest trace of horns. The Galloway breed of cattle was improved as early as if not earlier than any other breed of British cattle. Immediately after the union of England and Scotland an extensive demand sprang up from the southeastern counties of England for Galloway cattle, and this induced the breeders to make great efforts to improve their bovine stock, in which they were very successful. This improvement was brought about not with crossing with other breeds, but in breeding from the best and handsomest of both sexes, and by feeding and management. The improvement effected during the present century has been great, and it has been brought about by the same means, namely, by systematic and skillful mating of the best specimens of both sexes, and

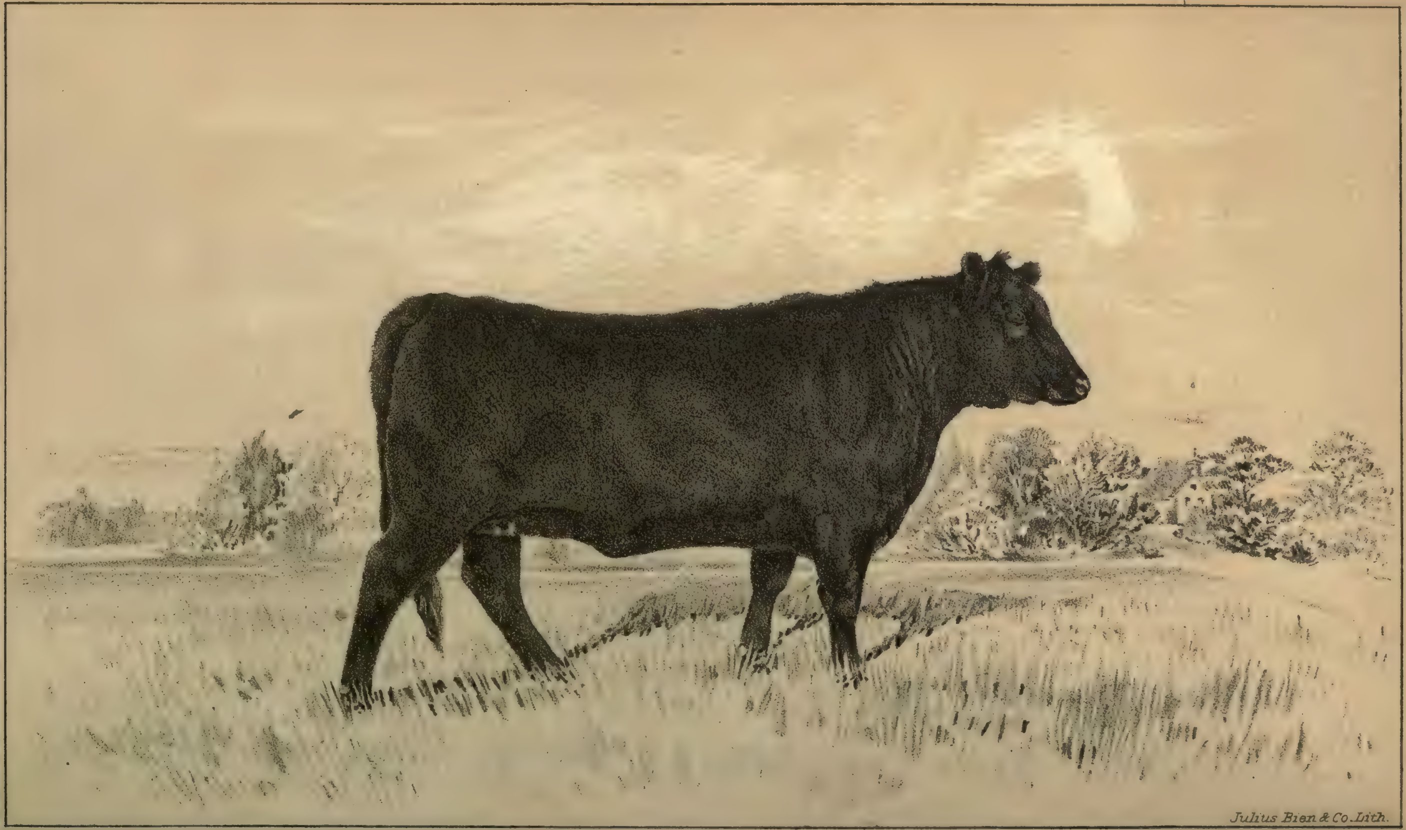
PLATE 44



Julius Bien & Co. Lith.

POLLED ANGUS BULL "PRINCE OF THE REALM"

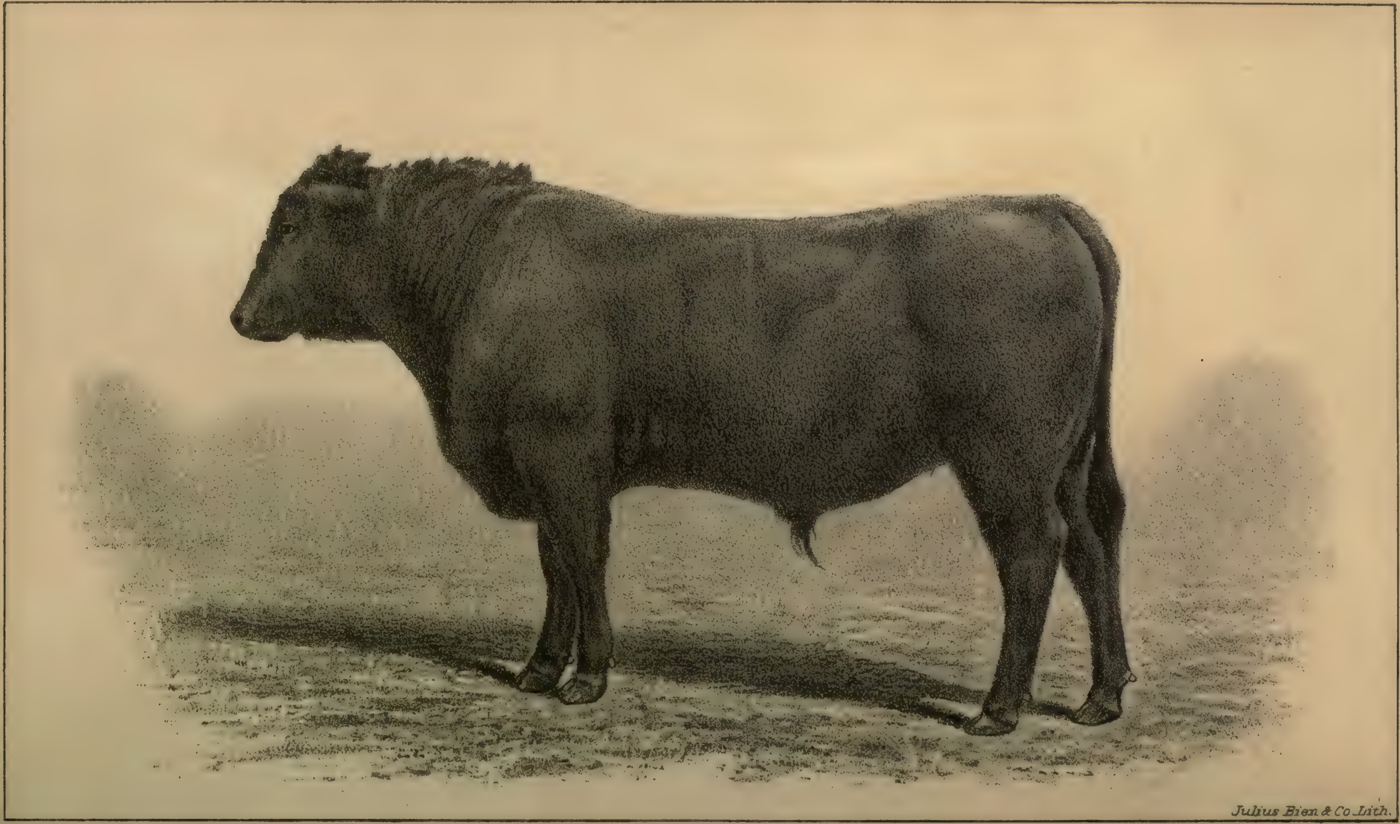
PLATE 45



Julius Bien & Co. Lith.

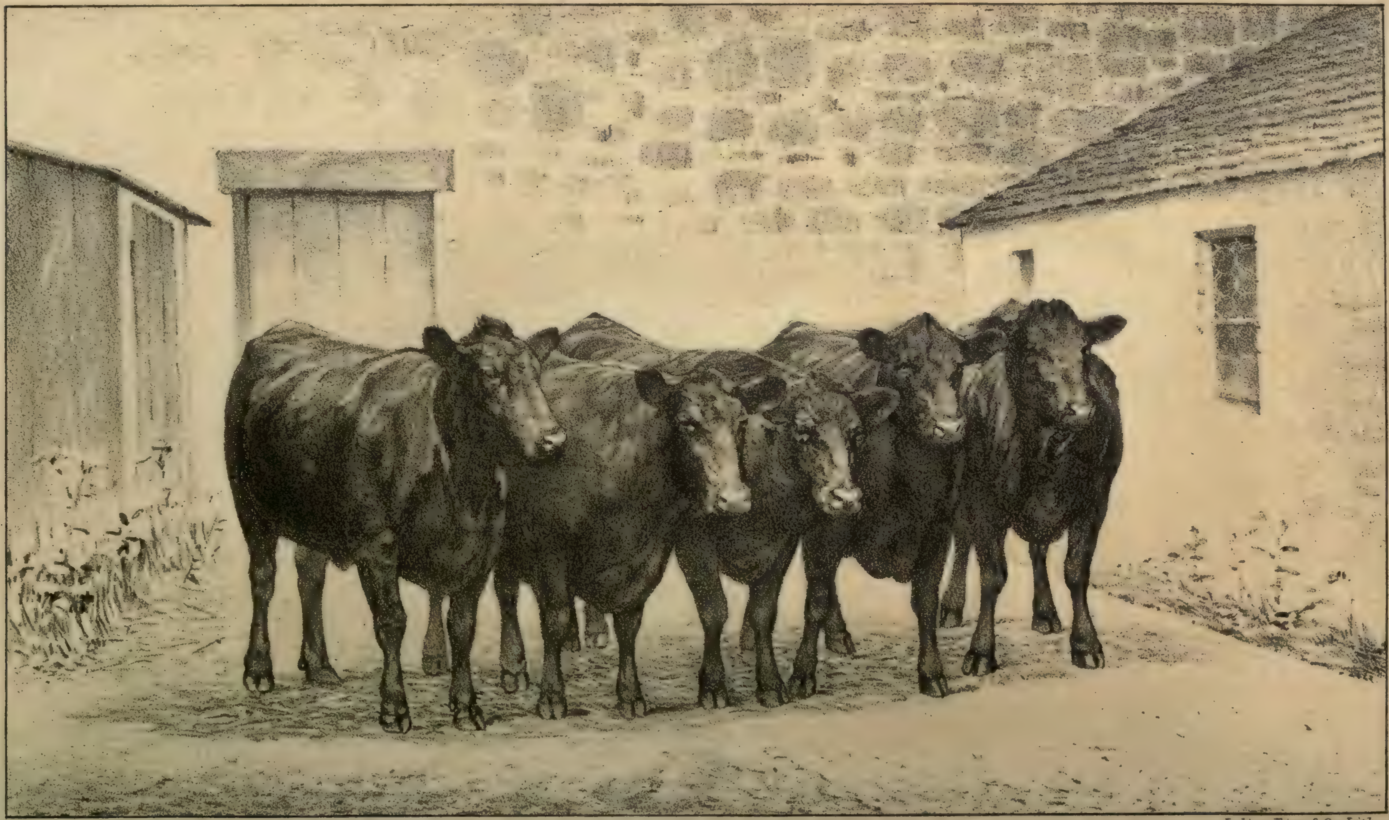
POLLED ANGUS YEARLING "FAVONIA"

PLATE 47


Julius Bien & Co. Lith.

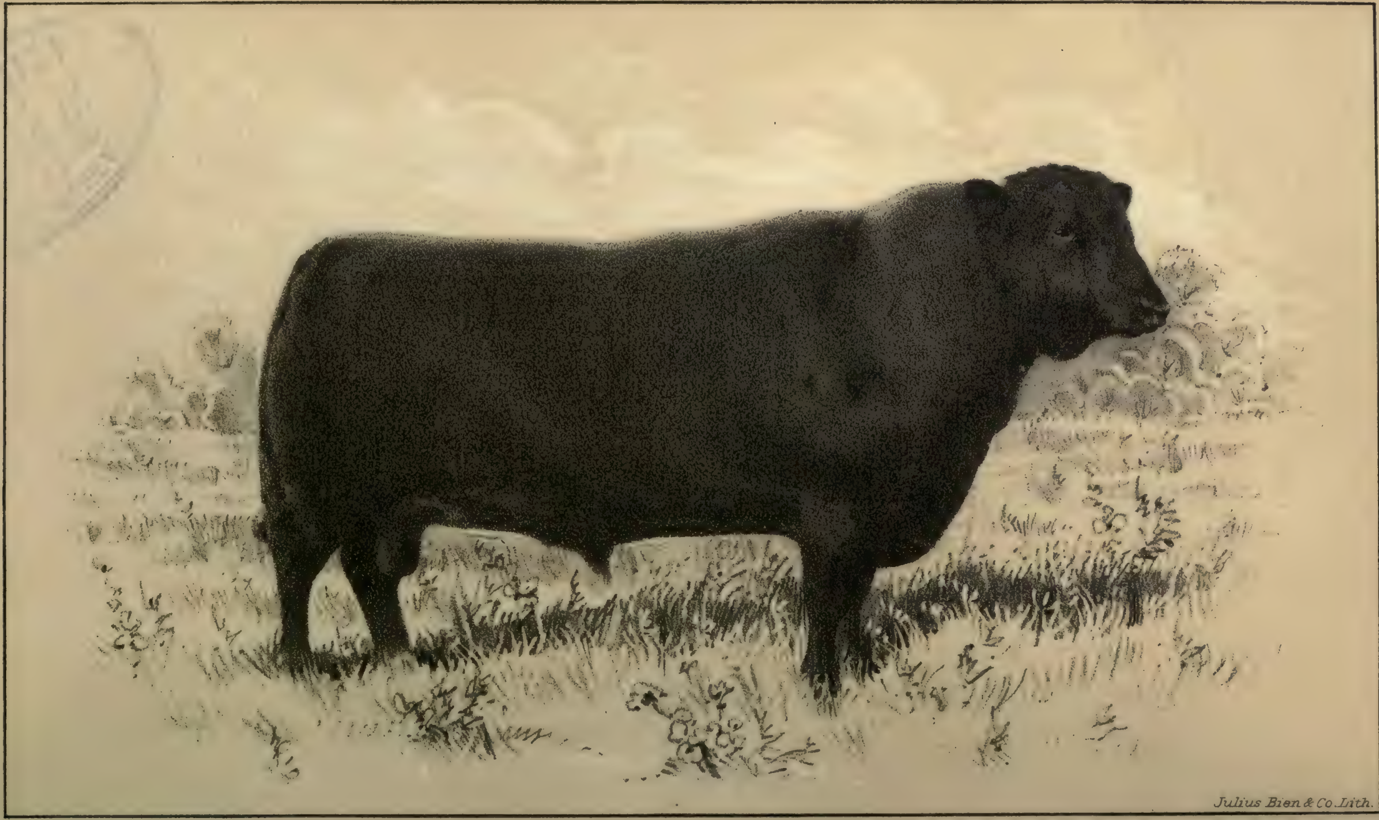
"PRINCE OF THE REALM" AT THE AGE OF 14 MONTHS

PLATE 48



Julius Bien & Co. Lith.

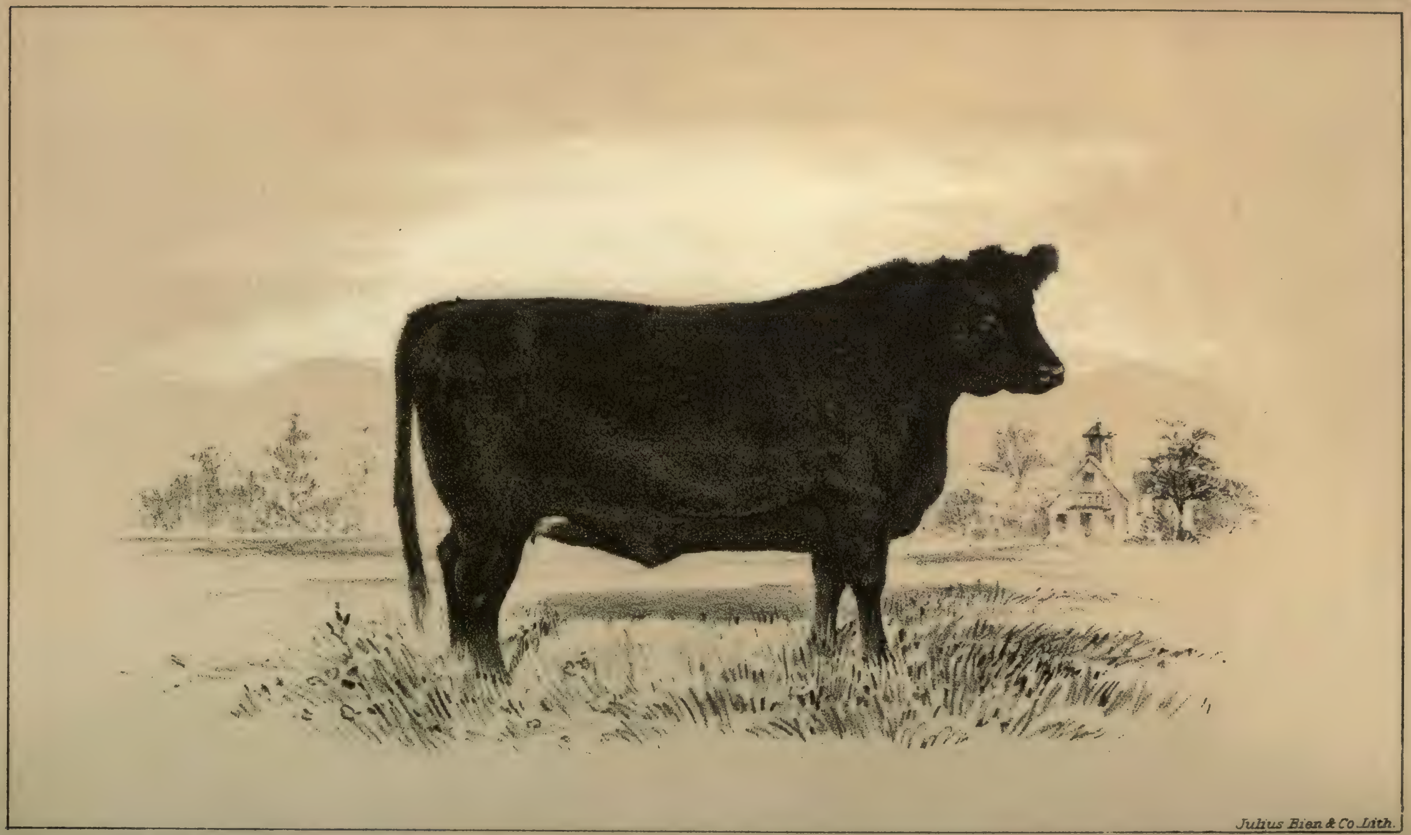
POLLED ANGUS HEIFERS, KINOCHTRY BREED


Julius Bien & Co. Lith.

YOUNG HERO

A POLLED ANGUS BULL BRED BY AND THE PROPERTY OF MR HANNAY GAVENWOOD, 1883_WON FIRST PRIZES
AT TURRIFF & BANFF SHOWS, AND SECOND PRIZES AT HIGHLAND SOCIETY SHOWS, BESIDES
PRIZE PLATE AT TURRIFF &C AND BOUGHT AT PUBLIC SALE IN 1883 FOR $

PLATE 50

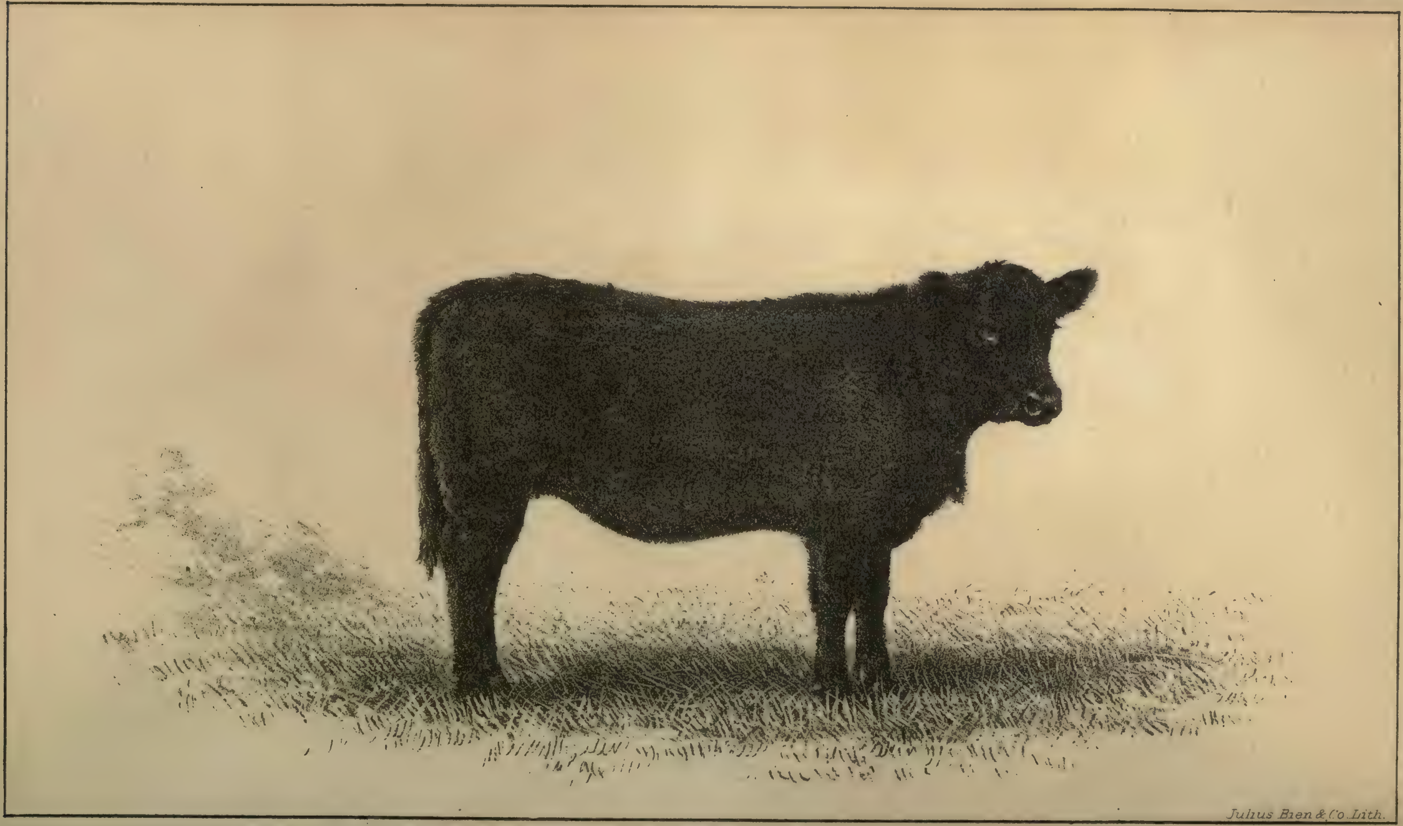


Julius Bien & Co. Lith.

POLLED ANGUS HEIFER "PRIDE OF ABERDEEN"

A TWO YEAR OLD HEIFER BRED BY AND THE PROPERTY OF
MR HANNAY GAVENWOOD 1883

PLATE 51

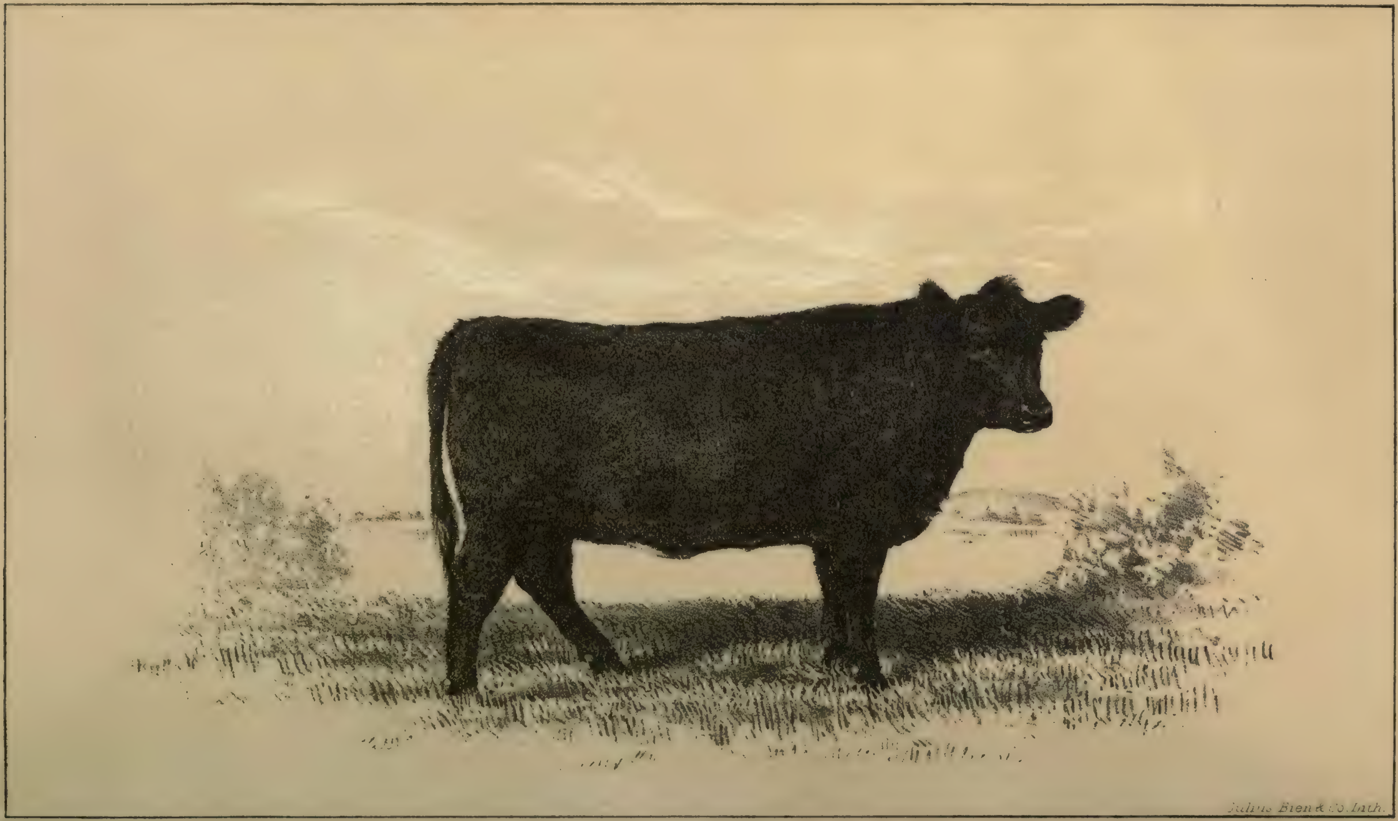

Julius Bien & Co. Lith.

POLLED ANGUS HEIFER CALF "PROSPERA PRINCESS"

(DESCENDED FROM A CELEBRATED PRIZE WINNER).

BRED BY AND THE PROPERTY OF MR. HANNAY GAVENWOOD, 1883.

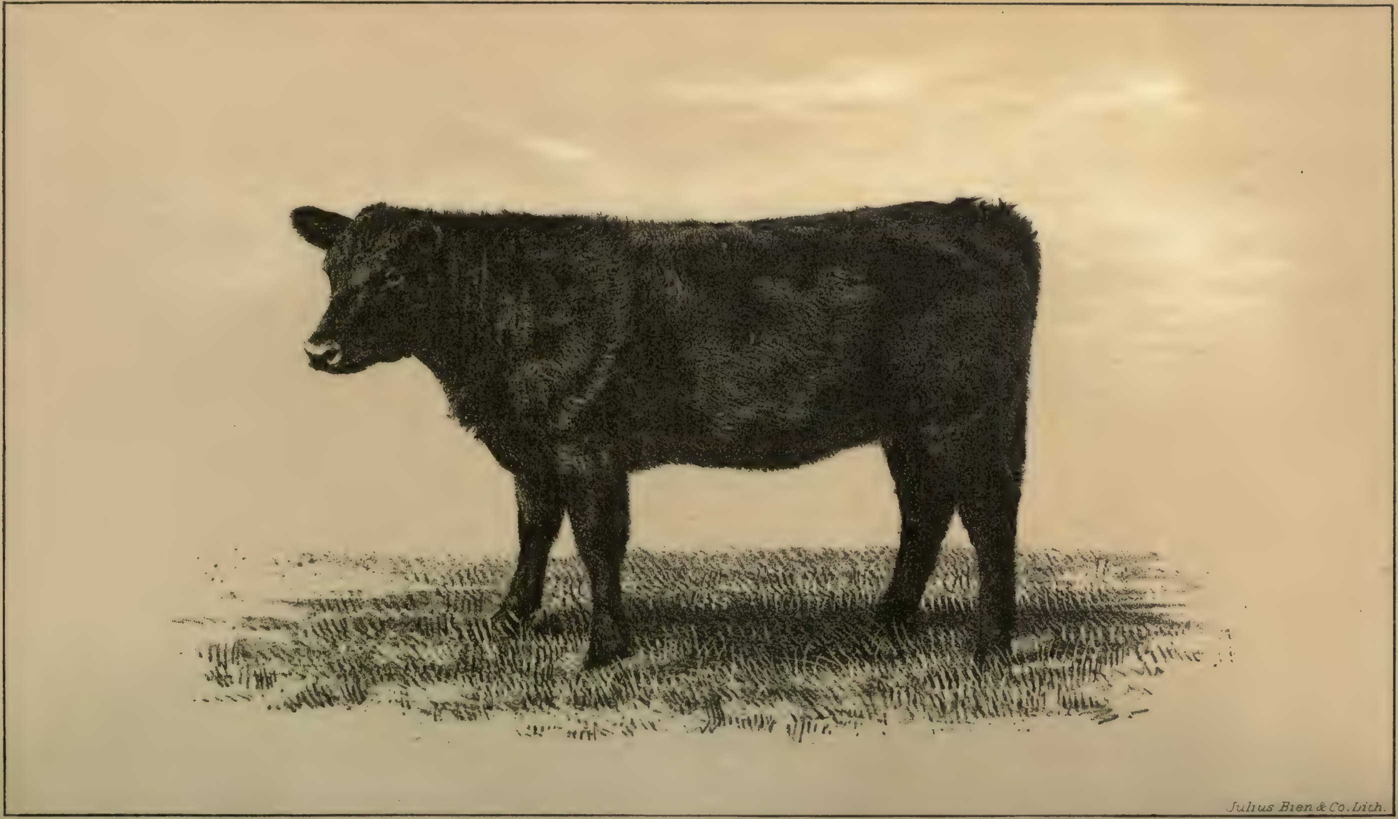
PLATE 52



Julius Bien & Co. Lith.

POLLED ANGUS TWO YEAR OLD HEIFER "BENEFIT".

WON FIRST PRIZE AT HUNTLEY 1883, AND IS CALF OFF THE CELEBRATED PRIZE COW "BLACKBIRD" OF CORTALLY 2^{D} WHICH SOLD FOR £420 IN AMERICA

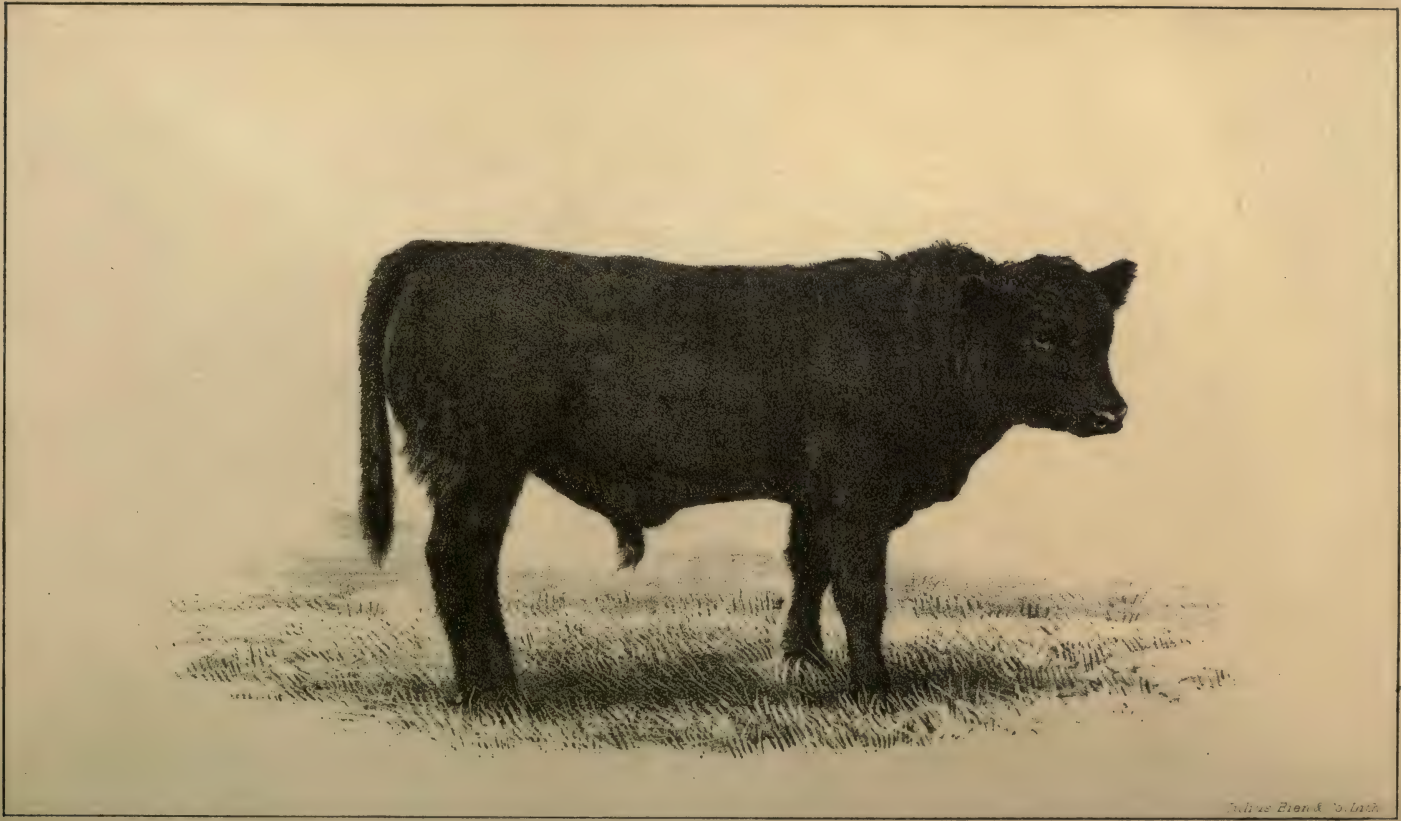


Julius Bien & Co. Lith.

POLLED ANGUS HEIFER CALF "VIGNETTE"

BRED BY AND THE PROPERTY OF MR HANNAY GAVENWOOD 1883

WON THE FIRST PRIZE AS ONE OF THE BEST FIVE HEIFER CALVES AT BANFF 1883

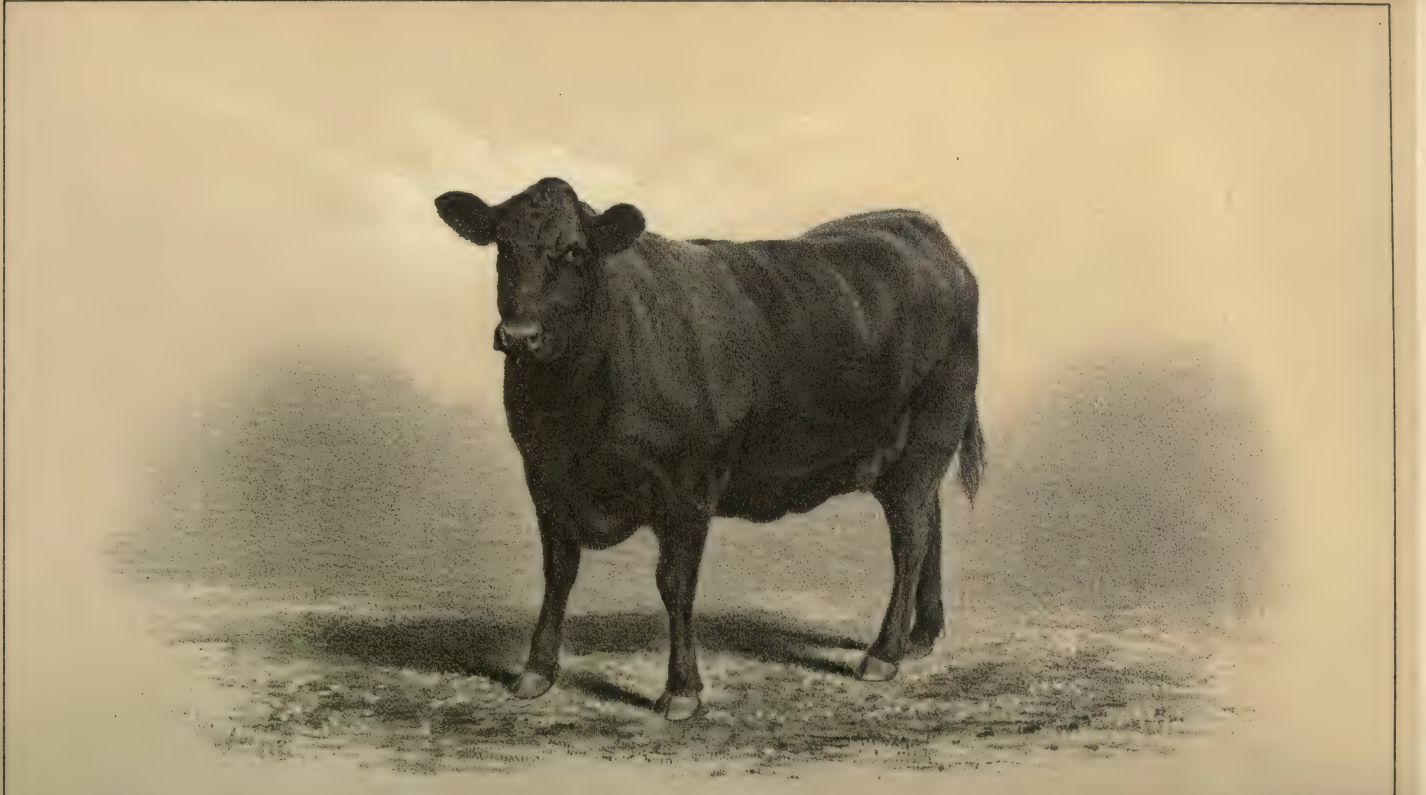


Julius Bien & Co. Lith.

POLLED ANGUS BULL CALF "ALLEGRO"

BRED BY MR HANNAY, GAVENWOOD. [illegible] PROPERTY OF MR [illegible]
BLAIRMORE, [illegible] SIRED BY "[illegible]NG HERO"

PLATE 55

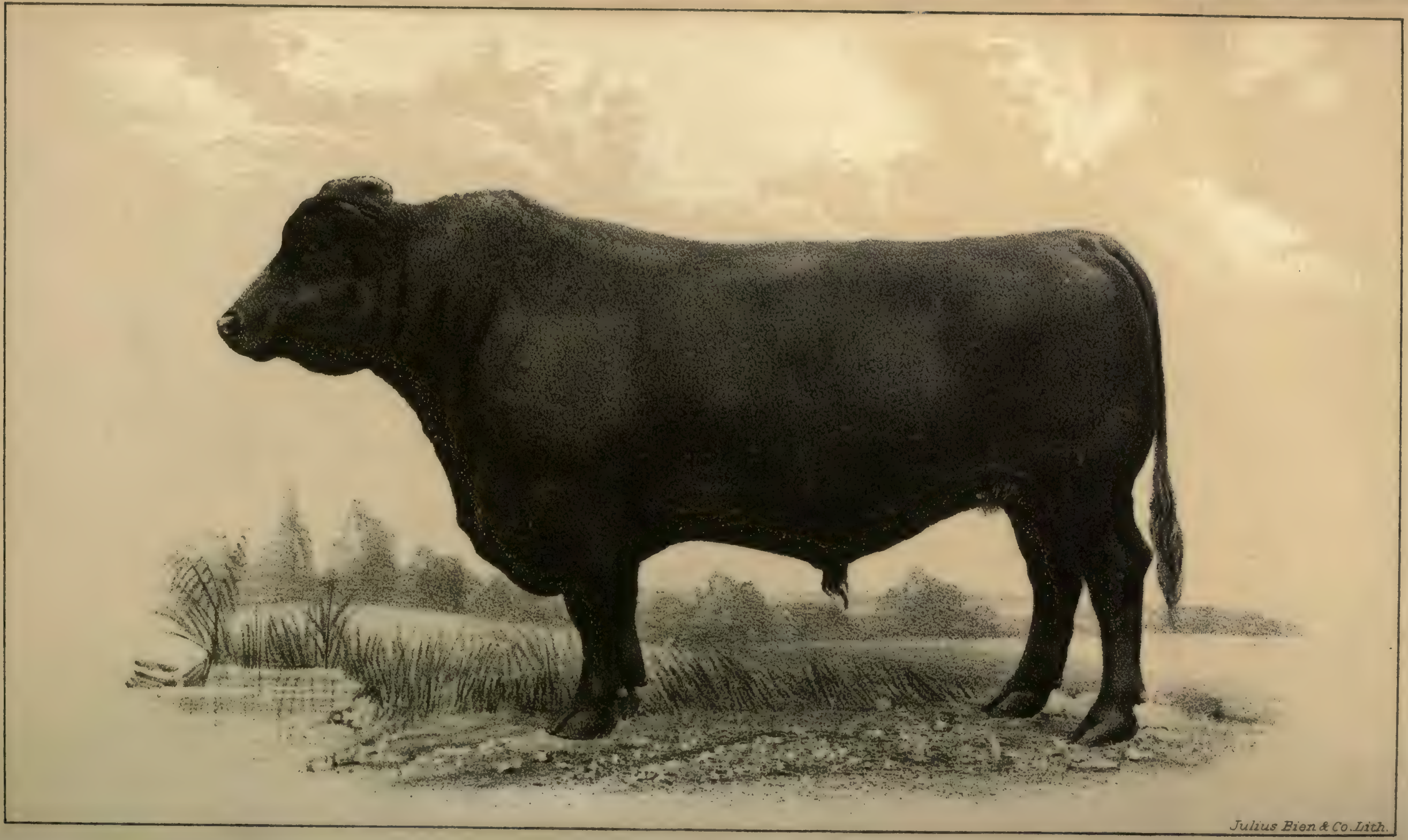


Julius Bien & Co. Lith.

TWO YEAR OLD POLLED ANGUS HEIFER

BRED BY AND THE PROPERTY OF MR FERGUSON, KINOCHTRY

PLATE 56

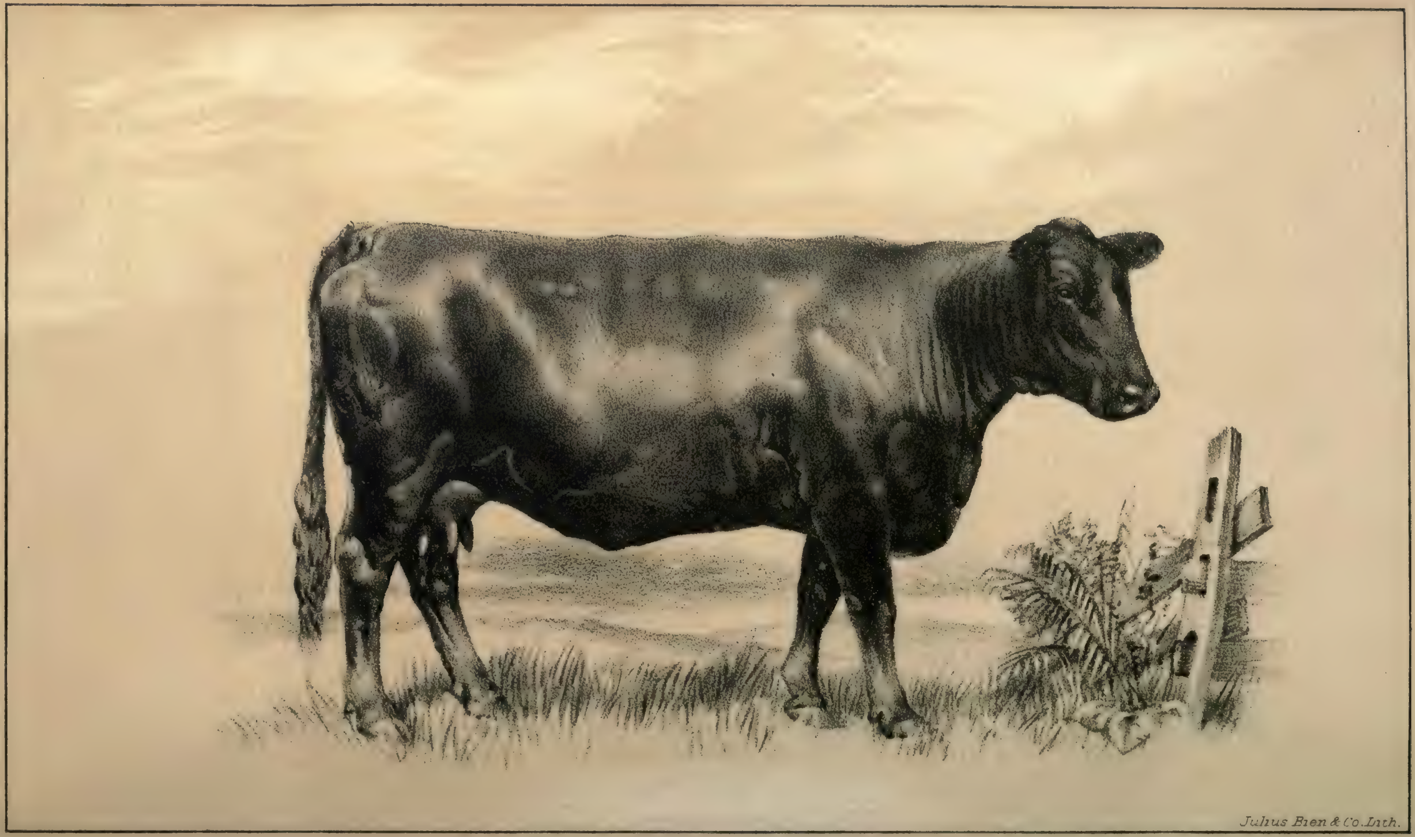


Julius Bien & Co. Lith.

POLLED ANGUS BULL "THE SHAH"

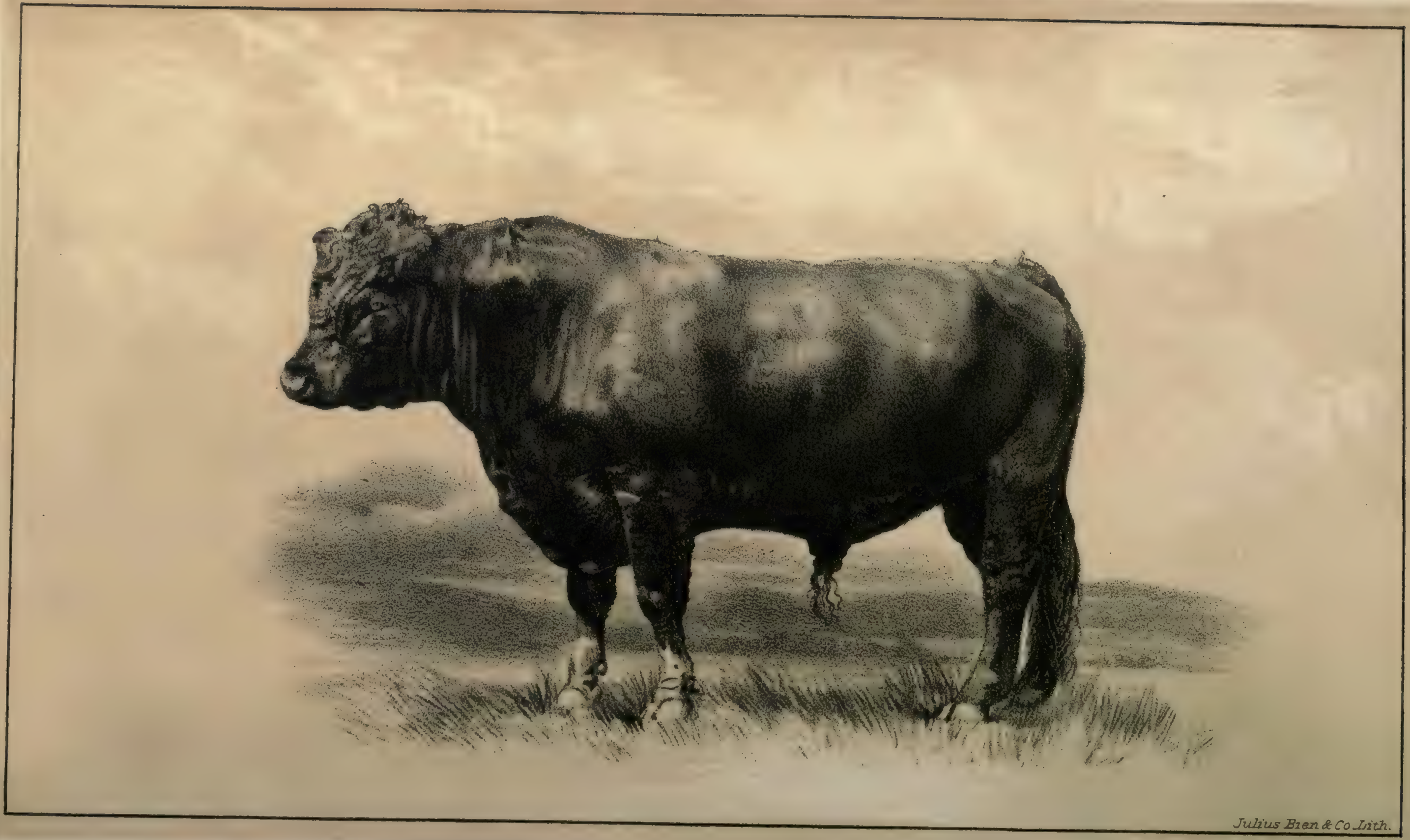
BRED BY AND THE PROPERTY OF MR FERGUSON

PLATE 58



Julius Bien & Co. Lith.

POLLED GALLOWAY COW



Julius Bien & Co. Lith.

POLLED GALLOWAY BULL

also by attention to diet and general management. The Galloways, as a breed, cannot lay claim to any superiority as milkers. Their milk is rich in quality, but the quantity they give is not large. However, the milking faculty runs in some strains, and individuals of them are excellent dairy cows. It is mainly as a beef-producing breed that Galloways have made a name for themselves. The quality of their beef is similar to that of the Aberdeen, Angus, and West Highland. The beef of these three breeds ranks as "prime Scots" in the Smithfield and other leading British fat markets, realizing there the highest current rates. Its superiority arises from the fact that it is well marbled, the fat being well intermingled with the lean.

In respect of proportion of dead to live weight Galloways kill unusually well, matured animals of the breed being estimated by experienced butchers to dress upwards of 60 per cent. of their live weight. Galloways arrive at maturity when from two to three years of age, according to the way they are kept when young. A well-fed Galloway may be estimated to weigh when two years and nine months old 1,600 pounds live weight, and 1,000 pounds dead weight. Many weigh more, but others reared under adverse circumstances are less. No cattle in Britain are hardier than the Galloways except the West Highlanders, and the difference between these two breeds in this respect is very slight. In all improvements of the breed the retention of this ancient characteristic of them has been successfully kept in view. While their skin is mellow to the touch it is moderately thick. Moreover the profusion of long, soft hair, with a thick, mossy undercoat, which has always been characteristic of this breed, conduces to and is symptomatic of their exceptional hardiness. The Galloways are kept on the low-lying farms, where mixed farming, grain-growing, and cattle breeding and feeding are practiced, and also on the intermediate hill grazings between the high mountains and the lower valleys. Many herds are located in hill-lying districts where the climate is so severe and cold that the growth of the cereals is not attempted. A large number of young Galloways are wintered in the open air, "the sky and the hills and the glen," as has been said, being their only winter shelter. This system is pursued not from scarcity of house accommodation but of deliberate choice, it being found by experience that from their hardy nature and being inured to exposure they are not only able to stand the severities of the climate, but that they thrive better and make more progress during the succeeding summer and autumn when wintered in the open air than under cover. It is a valued characteristic of the Galloways that they thrive well when kept upon poor and scanty fare, and indeed they have long proved themselves able to stand adverse circumstances, whether these arise from soil or climate or both. They are remarkably impressive as a breed, which is no doubt due to the length of time—at least nearly two centuries—they have been bred from animals of the same type and possessed of the same characteristics. Alike in respect of color, absence of horns, and general outline and symmetry, their offspring from cows of other breeds so very closely resemble the black Galloway Polls that it is not easy to distinguish a pure from the cross-bred animal.

When the Galloway bull is put to horned cows of any breed from 95 to 100 per cent. of the produce are found to be black and hornless, and in stamping their offspring with their qualities otherwise the prepotency of the Galloways is very marked.

Galloways have long been in great favor for crossing with other breeds.

Bulls of this breed have been very extensively put to both Short-horns and Ayrshire cows, and in England especially it has been a favorite and highly successful mode of crossing for beef purposes to use the Short-horn bull on the Galloway cow. By either mode symmetrical cattle of large frames are produced. They are hardy and their meat is free from patchiness, well mixed and superior. These Galloway crosses mature early and reach very heavy weights. A Galloway cattle society exists, its two main objects being (1) to maintain unimpaired the purity of the breed of cattle known as Galloway cattle, and to promote the breeding of these cattle, and (2) to collect, verify, preserve, and publish in a Galloway herd-book the pedigrees of the said cattle and other useful information regarding them. The headquarters of this society are at Dumfries, Scotland, and it has published eight issues of the Herd-Book.*

Both of these animals (Nos. 15 and 16) are first-prize winners at the Highland and Agricultural Society Show of Scotland, and are the property of and bred by Mr. James Cunningham Yarbreach, of Dalbeattie, Scotland.

THE AYRSHIRE AS DAIRY CATTLE.

I have been supplied with the following information regarding this breed:

The Ayrshire is emphatically the Scotch dairy breed, and a thoroughly thrifty dairy cow, and one that will fatten rapidly when dry, has few equals. The origin of this breed is difficult to trace; no particular men seem to have stood out conspicuous from their fellows as breeders or improvers. The chief excellence of the breed is supposed to have arisen from the peculiar circumstances of climate, soil, and situation of several of the western counties of Scotland. The farmers in these districts noted the points that indicated good milkers, and, as a consequence, the best milking cows were put to good bulls, and in this way a very superior dairy breed has been established in the west of Scotland, and spread rapidly over most other parts of the country. No breed of cattle in Scotland will produce an equal quantity of milk, butter, and cheese to the Ayrshire. Many cows, when in their best condition and well fed, will yield 3 gallons per day for three months, and produce a total of from 500 to 700 gallons per cow per year; 600 gallons per cow for the year has been considered an average on good farms. The proportion of milk to butter and cheese, the standard recognized in Ayrshire, is about (in imperial British gallons) 2½ gallons of milk to 1 pound of butter, and 1 gallon of milk to 1 pound of cheese. The average weight of a gallon of milk is 10 pounds 8 ounces, and the following figures show the result of a milking competition at Ayr on the 26th and 27th days of April, 1861:

---

* Here follows a statement concerning the true characteristics of the Galloway breed, which was not published for the reason that a similar statement appears in the report from Leith, to which the reader is referred.

Name of owner.	Greatest milking.		Average of four milkings.		Weight of butter.	
	Lbs.	*ozs.*	*Lbs.*	*ozs.*	*Lbs.*	*ozs.*
A. Wilson	28	12	24	3½	2	2
J. Hendrie	26	0	24	5	2	14½
W. Reid	25	7	20	8¾	2	9
R. Wallace	28	14	28	8½	1	9½
W. Reid	30	15	27	5½	3	6½
R. Wallace	25	5	23	8½	1	15

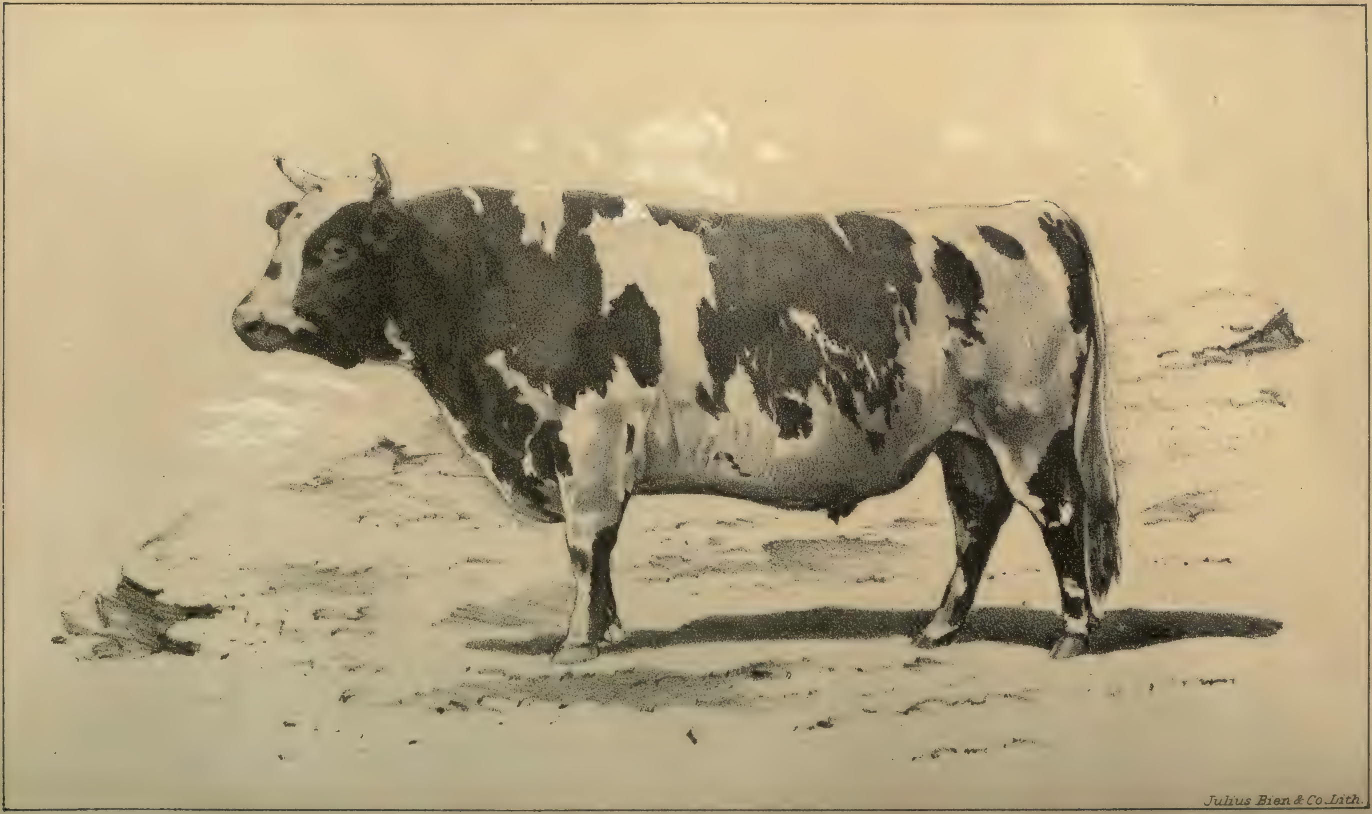
In the above competition the greatest yield at a single milking was rather over 3 gallons, which produced at the rate of 15 pounds of butter per week.

Being a competition, and the cows highly fed, the returns afford no fair criterion of the ordinary milking capacity of an Ayrshire cow. Two distinct classes of cows might be selected from among the Ayrshires—butter and cheese makers. Many cows, however, combine both the butter and cheese making faculties in a remarkable degree. Compared with the Polled Angus and Shorthorn, the Ayrshire is a small breed, but it is said that when crossed with a bull of either of the two breeds mentioned, the produce is an animal admirably adapted for maturing early and fattening rapidly. The color of Ayrshires is generally of red and white in spots; sometimes white and black, or red or brown, and the horns are fine and twisted upwards. The face long, with a lively yet docile expression.

The figure of the body, enlarging from the fore to the hind quarters; broad across the loins; the back straight; the tail fine, long, and bushy at the extremity; the udder white and capacious, coming well forward on the belly; the teats of middle size, set equally and wide apart from each other; milk veins prominent and fully developed.

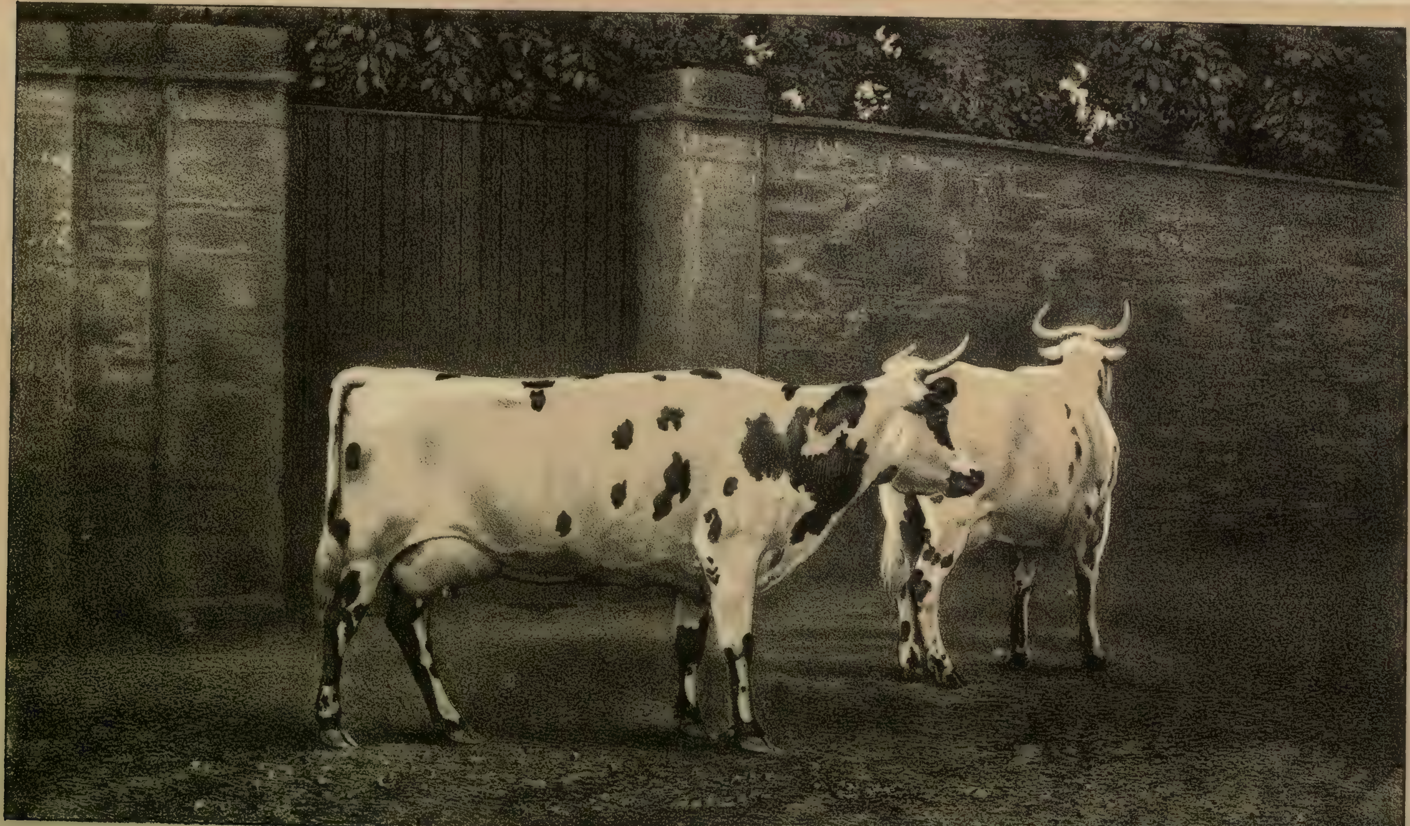
THE WEST HIGHLANDS.

This hardy breed of cattle may be stated to ocupy as its home the whole of the West and Middle Highlands of Scotland and the Western Islands. No cattle are possessed of more distinctive and strongly


Julius Bien & Co. Lith.

AN AYRSHIRE BULL

THE PROPERTY OF MR PARKER NETHER, BROOMLANDS, AYRSHIRE.



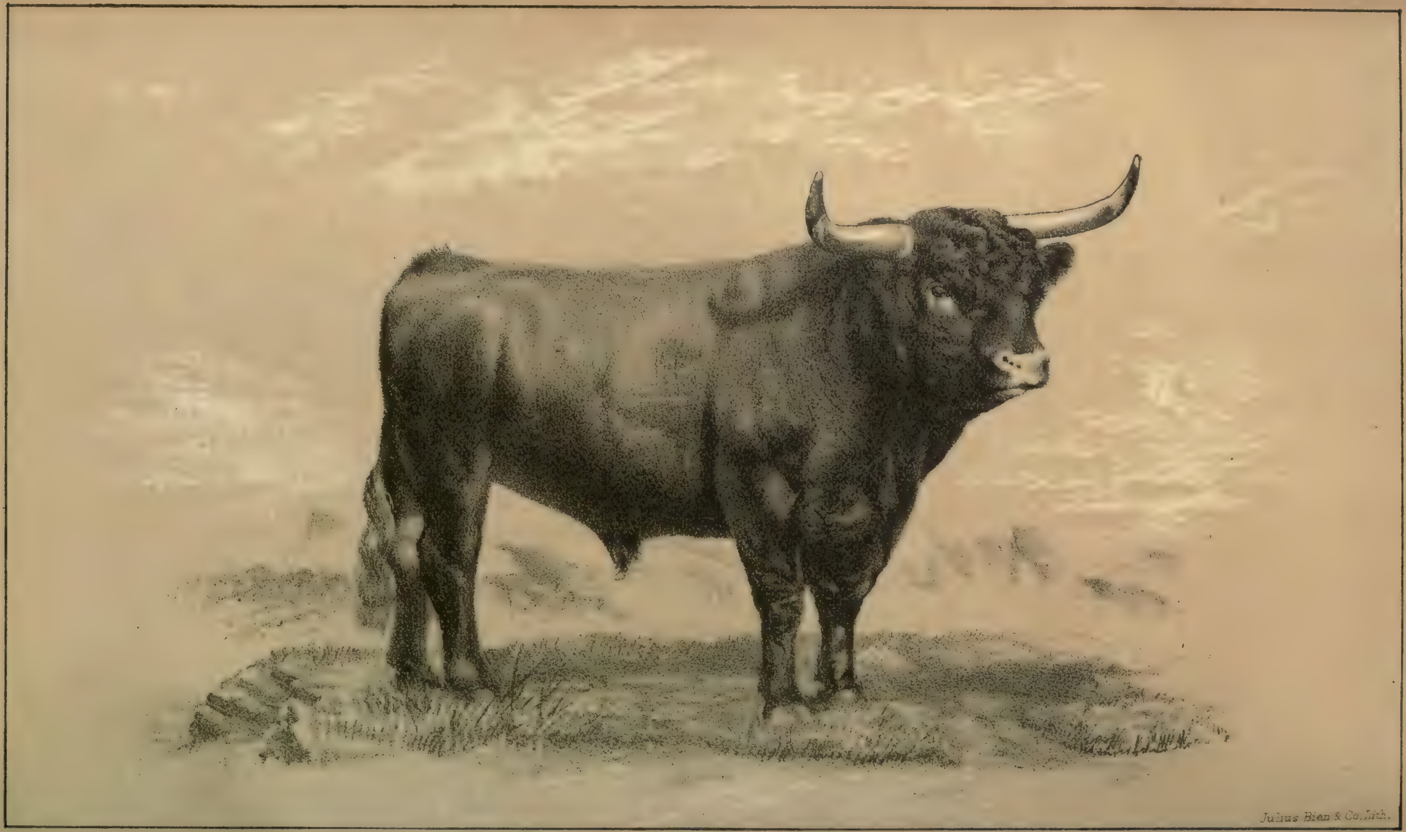
Julius Bien & Co. Lith.

AYRSHIRE COWS "CALLYHILL" AND "MATE"

THE PROPERTY OF THE DOWAGER DUCHESS OF ATHOLE DUNKELD

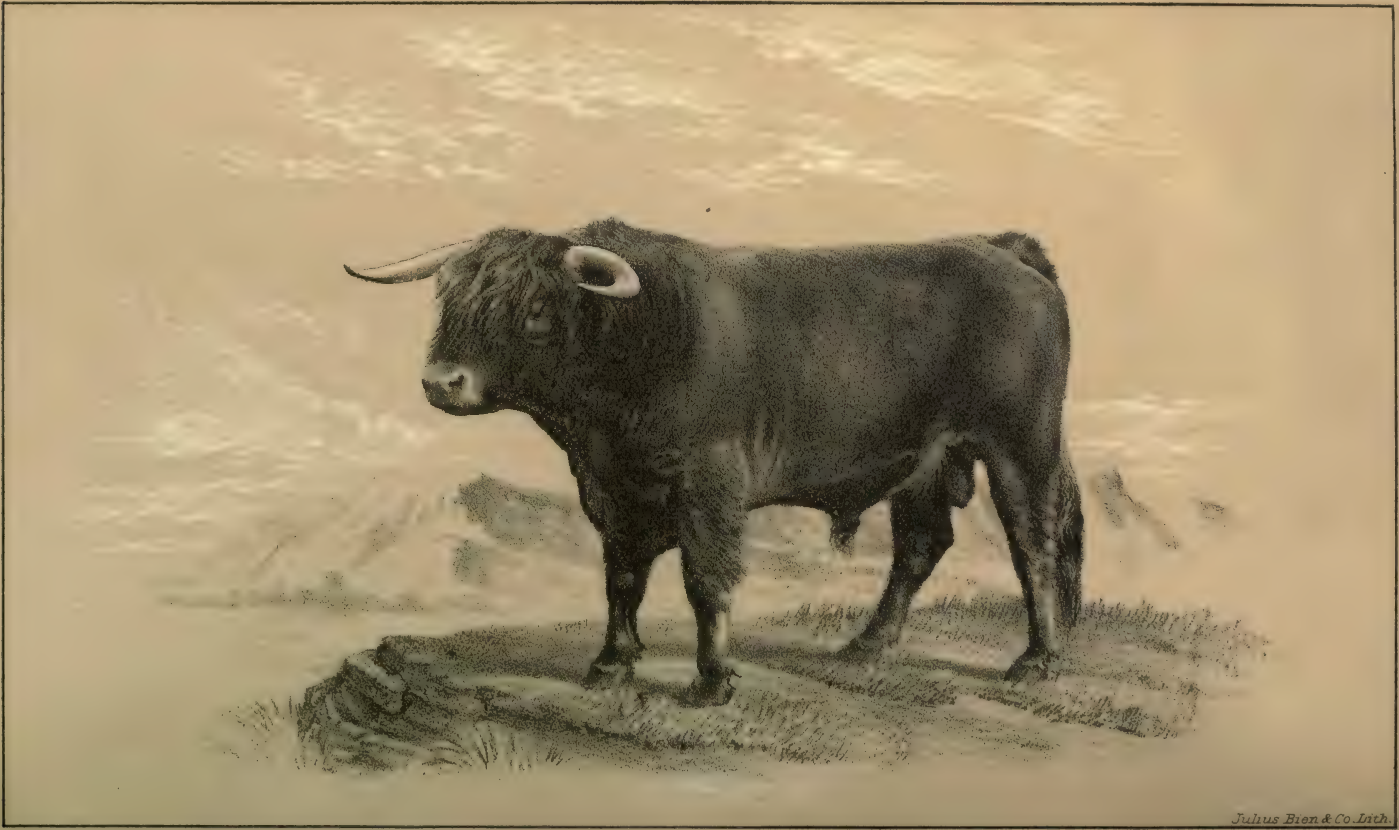
BOTH THESE ANIMALS ARE CONSIDERED VERY FINE SPECIMENS OF THEIR BREED

PLATE 61


Julius Bien & Co. Lith.

WEST HIGHLAND BULL

PLATE 62

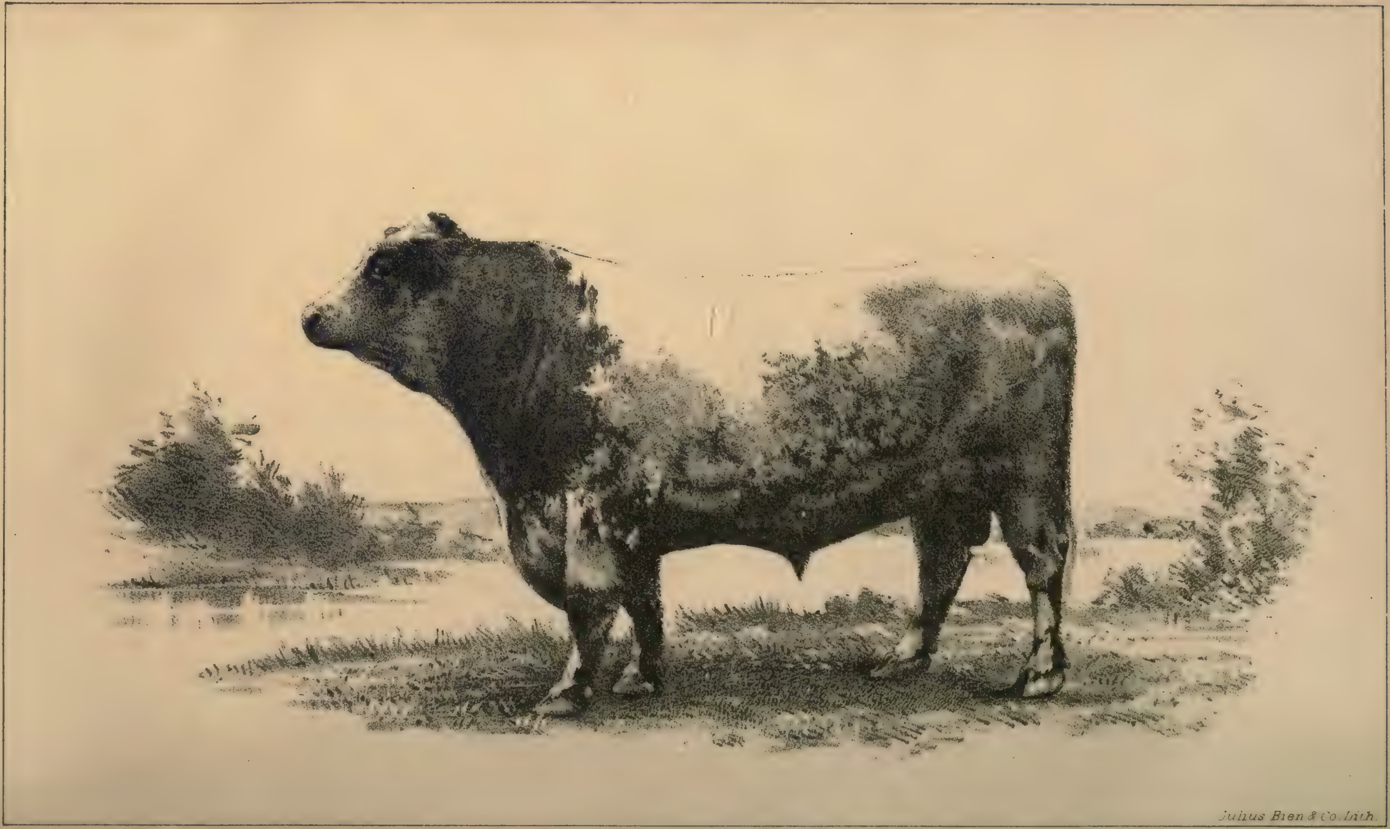


Julius Bien & Co. Lith.

TWO YEAR OLD HICHLAND BULL

FIRST PRIZE WINNER

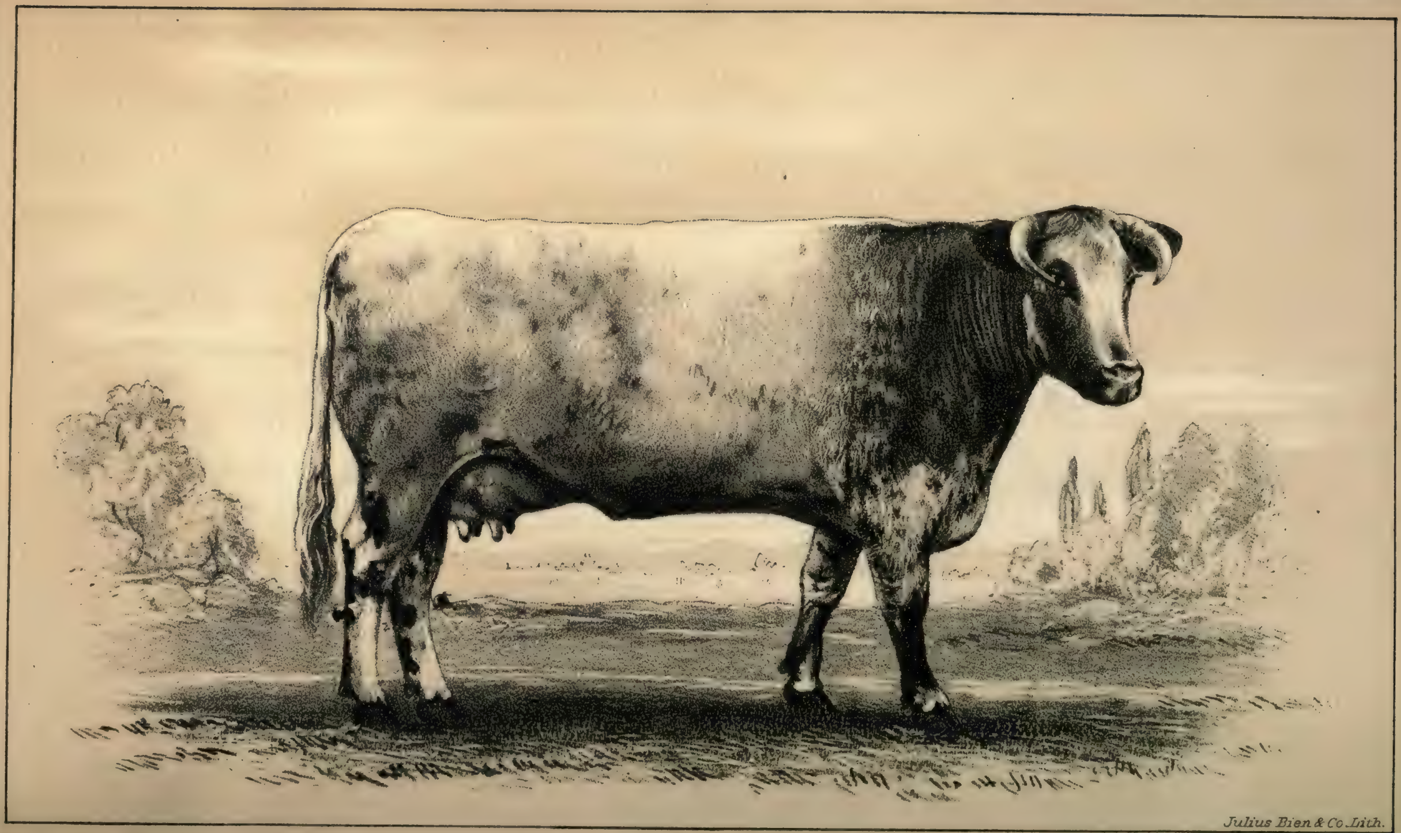
PLATE 65



Julius Bien & Co. Lith.

SHORTHORN PRIZE BULL

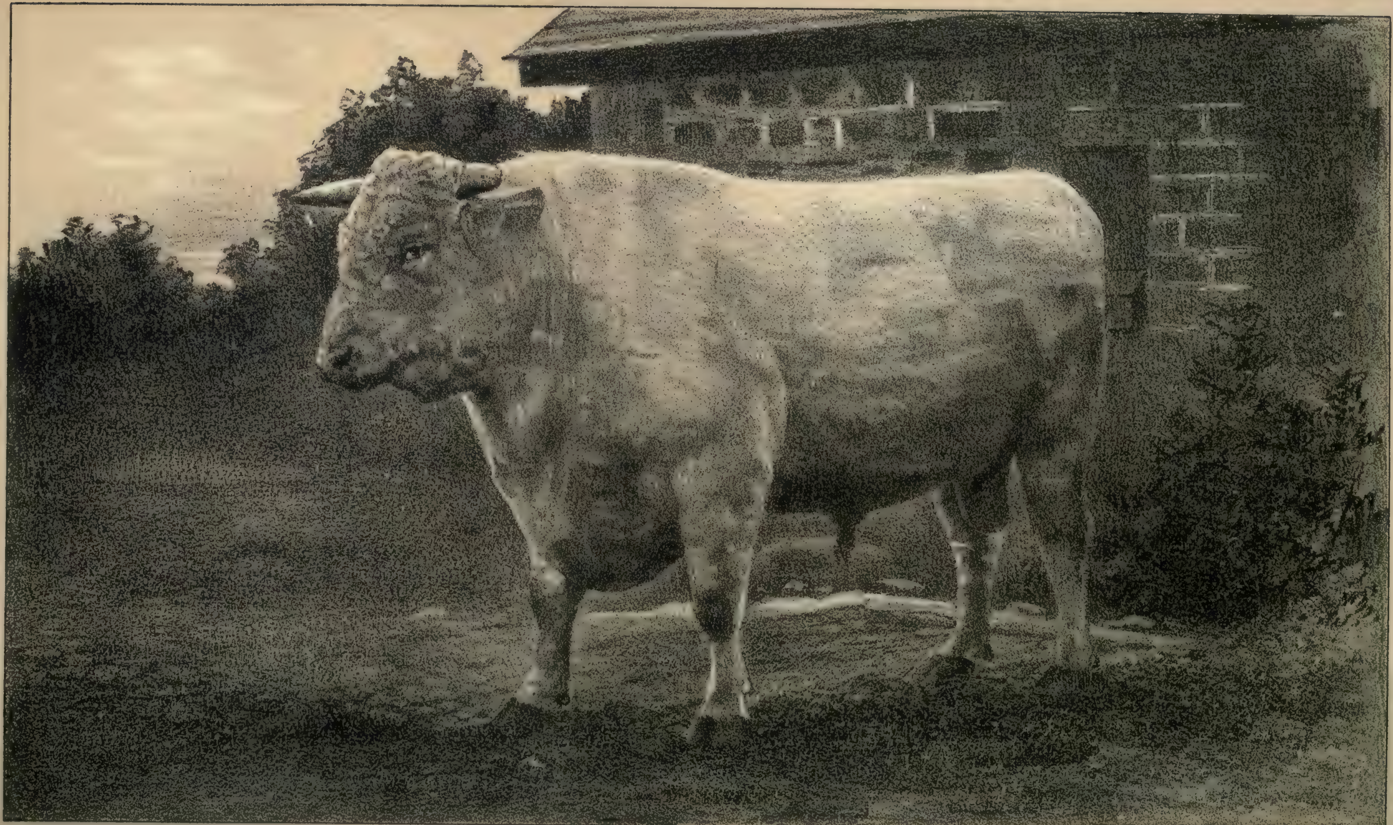
PLATE 64



Julius Bien & Co. Lith.

SHORTHORN COW "ROSA BONHEUR"

BRED BY AND THE PROPERTY OF LORD STRATHALLEN, THIS COW WON FIRST PRIZES AT THE AGRICULTURAL SHOWS (NATIONAL) OF BOTH ENGLAND AND SCOTLAND, AND MAY BE, THEREFORE, CONSIDERED ONE OF THE BEST OF THE BREED



Julius Bien & Co. Lith

SHORTHORN BULL "FOSCOE"

marked features than this breed. Their limbs are short, but muscular; chests wide and deep; ribs well developed and fairly arched; backs straight; neck and dewlap somewhat coarse in the bull; horns of great length, spreading and tipped with black; colors various—brindle, dun, cream, red, and black. They give only a small quantity of milk, and are very slow in arriving at maturity, not becoming ripe until the age of five or six years. Their beef is of a very superior quality and their hides make the best of leather.

SHORTHORNS IN SCOTLAND.

Shorthorns, as their name denotes, have short horns, and in color they vary from pure white to a deep or rich red. The most popular color for these animals in Scotland is a mixture of the two, forming a deep or light roan, sometimes called strawberry, flecked, or hazel.

Shorthorns are as symmetrical as the Polled Angus, and grow about the same weight. They are hardy and arrive at maturity early; but, like the Polled Angus, they are principally noted as beef cattle. For the dairy they are not equal to some other breeds in Scotland. The first improvers of Shorthorns were the brothers Charles and Robert Colling, who commenced improving these cattle nearly a century ago; also Mr. Bates, Mr. Booth, and others, all in the northern counties of England.

OFFSPRING OF IMPORTED CATTLE.

The Departmental circular says:

> It is further believed that the imported breeds, when suitably located and managed, produce in their new homes offspring superior to that produced by the same breeds in their original homes, and that the superiority is more marked in their succeeding than in the first generations.
>
> For instance, the imported breeds of Shorthorns, Jerseys, and Holsteins are superior in the United States to the same breeds in Europe; and it is thought that the same result would follow the importation of the Norman, Brittany, Flemish, and Charlevoi breeds, as well as others not enumerated. To what extent is this result realized in other countries?

In answer to this it has to be stated that, as Scotland does not import cattle to any appreciable extent for breeding purposes, little experience can be quoted on the point in question. A few Shorthorns have been imported from the United States which were descended from stock originally sent from this country.

The breeding Shorthorns imported from the United States by Lord Dunmore and other noblemen were of considerably larger size than animals of the same lineage reared in Britain. The ancestors of Shorthorns had been in the United States for several generations and the superiority of their offspring imported to Britain over British-bred stock of the same breed was most marked. This would lead to the inference that cattle grow to a larger size in the United States than in Britain, the more especially as the herds of these noblemen who imported the cattle from the United States contained many of the largest and best-fed animals of the breed in the country.

BEST METHODS OF EXPORTATION TO THE UNITED STATES.

Scotland is well supplied with railroads, and the cattle can be put into special trucks and conveyed quickly to Glasgow, Liverpool, or London, where there are facilities of the best order for shipment, and most suitable and convenient accommodation for animals on board the large Atlantic liners which sail from these ports.

BEST ROUTES OF EXPORT, AND COST THEREOF.

Per rail to Glasgow, Liverpool, or London, thence per suitable or specially fitted up fast steamers to the United States. The "through freight" of cattle from most parts of Scotland to the United States is about $26 per head; from the extreme northeast of Scotland, Aberdeen, Banff, or Peterhead, about $27.50.

THE BEST SCOTCH CATTLE TO EXPORT.

The most suitable animals to export to the United States depends on the climatic conditions of the States to which they are sent. As beef producers the Polled Angus, Shorthorns, West Highland, and the Polled Galloway are the best to export from this district. The West Highlander's beef is considered the best, and they are the most hardy, being able to stand much exposure and therefore best adapted for cold and mountainous districts, being able to live on coarse and scanty food. They are, however, small, and do not arrive at maturity till three or four years old. The Polled Angus rank next for superior beef, and are nearly as hardy as the West Highlanders, and are much larger in size and come to maturity at the age of from twenty-eight to thirty-six months. They are principally bred and raised in the northeast of Scotland, and are believed to be very suitable for the northern part of the United States and western ranches. The Shorthorns are very large, and come to maturity at about the same age as Polled Angus, but their beef is of a coarser quality.

The Polled Galloway very much resembles the West Highland, although larger, and comes to maturity earlier. The Aberdeenshire farmers, for beef, prefer a cross between a Shorthorn bull and a Polled Angus cow, as crosses of this origin arrive quickly at maturity, are of good size, and produce beef of fine quality.

As milkers the Ayrshires are undoubtedly the best to take from this country.

PURCHASING PRICES OF ANIMALS.

	Per head.	
Average pure Polled Angus cattle	$150	to $300
Black Polled Galloways	100	250
Shorthorns	125	250
Ayrshires	75	150
West Highland	75	125

All, of course, depends on quality.

Very superior sepcimens of all of the breeds mentioned have repeatedly been sold for exportation to the United States at considerably higher prices than the average given, but to obtain adequate specimens of the several breeds in this district the averages mentioned would have to be given, although sales at less prices have occasionally been made.

For expenses for attendance and food *en route*, $6.25 for food (hay and oil cake), and $1.25 per head for attendance—total, $7.50—is considered sufficient, and with a good number of cattle on board the total expense would be about $6.25. Some experienced United States traders in thoroughbred cattle are supposed to make $3.25 cover the total charges under this head.

CATTLE STATISTICS OF SCOTLAND.

The total number of cattle in Scotland for the year 1883 was 1,094,317.

The percentage of the several breeds is not known from any statistics, but probably the cattle stock of this district is composed of three parts of cross-breeds and one part of the several pure breeds.

The percentage bred for the dairy about 20; for the butcher, about 80 per cent.

Of late years stock in Scotland has decreased. Disease imported from time to time in live stock, causing farmers to cease from breeding cattle, has to a great extent been the cause of this decrease.

Another cause is to be found in the improvement of the cattle, making them ready for the butcher earlier. And a third cause is the increase of population and wages, and consequent enhanced demand for butcher meat, which for many years has been sold for high prices in the Scotch and English markets.

IMPORTS AND EXPORTS OF MEAT AND CATTLE.

The stock of cattle in Scotland is not nearly equal to the consumptive demand.

The stock as shown is not sufficient for home demand, excepting pedigreed stock, which is exported to the United States, Canada, Australia, New Zealand, West Indies, and the continent of Europe.

The farmers who in consequence of imported disease have ceased (in a measure), as already mentioned, to breed cattle, mostly get their supplies of feeding-cattle from Ireland, where a good many are bred and not many fattened.

Some cattle from the United States and Canada have also been fattened in Scotland, and there seems to be no reason why this latter trade might not be extended to the advantage of all concerned. But if the Scotch farmers bred and fed cattle to the utmost of their ability the supply of fat cattle would still not be nearly equal to the consumptive demand. The continent of Europe, United States and Canada supply a large proportion of the beef consumed in Scotland and there is every reason to expect that the British demand for beef from these countries will continue to increase.

THE NATURE OF THE IMPORT SUPPLIES.

From the continent of Europe the beef is mostly in its live state; from the United States about half the amount dead and the other half live. A large quantity of tinned or canned meat is also imported from Chicago and elsewhere in the United States. Some cargoes of frozen mutton have come from Australia and New Zealand which appear to have been a success. This trade is likely to increase.

IMPORTS FROM THE UNITED STATES.

A large number of live cattle, fresh meat in refrigerators, and tinned meat come from the United States.

THE BEST MEANS OF INCREASING THE EXPORTS OF AMERICAN MEAT.

If the United States Government would take measures to exterminate pleuro-pneumonia and to suppress any contagious diseases when they appear, the British Government would then admit freely the importation of fat and store cattle, greatly to the advantage of United States producers and of British farmers and consumers. The British farmers would profit greatly by having a supply of good store stock from the western plains, and fat stock would fetch a better price if they could be moved from the ports of landing to inland markets.

THE BEST MEANS OF INCREASING THE EXPORTS OF AMERICAN DAIRY PRODUCE

is to send the best articles properly packed, quickly and carefully conveyed, and they will then not only command the highest price in this market but the demand will also increase.

WILLARD B. WELLS,
Consul.

UNITED STATES CONSULATE,
Dundee, February 24, 1884.

Special statistics concerning the products of the several breeds of cattle in Scotland.

Name of breed.	Annual average pounds of milk.	Milk to 1 pound of butter.	Milk to 1 pound of cheese.	Live weight.			Age at maturity.	Weight of meat at maturity.	Color.
				Cow.	Bull.	Ox.			
		Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Yrs.*	*Lbs.*	
Improved Polled Angns.	4, 000	24	10	1, 200	1, 750	1, 500	3½	1, 100	Black.
Shorthorns	4, 200	26	10½	1, 300	1, 875	1, 600	3½	1, 150	Red, white, roan, and brown.
Ayrshire	6, 000	25½	10¼	850	1, 250	1, 050	4	630	Various.
West Highland	2, 500	24	10	900	1, 350	1, 150	5	850	Do.
Polled Galloway	2, 500	24	10	1, 000	1, 500	1, 300	5	900	Black.

Name of breed.	Description.	How long bred pure.	Origin of breed.
Improved Polled Angus	Long, low, deep, wide, even, and cylindrical and pleasing to the eye.	80 years	Hugh Watson first improver. His coadjutors were Walker, Ferguson, and Bowie.
Shorthorns	Formed same as Polled Angus, only larger.	do	Charles and Robert Colling, Mr. Booth, and Mr. Bates.
Ayrshire	(See description of Ayrshires in report.)	From time immemorial.	Not known.
West Highland	Shaggy-haired, level and square made.	do	Native cattle of Scotland.
Polled Galloway	do	30 years	Rev. J. Gillespie, Mouserwald, first improver.

Name of breed.	Methods of housing.	Feeding.	Breeding.	Handling products.
Improved Polled Angus	Housed in November, December, January, February, March, and April. Pastured during remaining months.	Pasture grass in summer, turnips and straw in winter; occasionally oil-cake added.	From 16 to 24 months.	Two men at $250 each per year are required for a herd numbering 120.
Shorthorns	Housed similar to the Polled Angus.	Grass, hay, turnips, and oil-cake.	do	Do.
Ayrshire	Housed longer than other breeds.	Grass, hay, turnips, and oil-cake; much cooked food in the shape of bran, beans, and meal.	do	$7.50 per head per annum.
West Highland	Seldom housed	Grass in the summer; occasionally straw and turnips in winter.	From 2½ to 3 years.	$2.50 per head per annum.
Polled Galloway	do	do	do	Do.

Altitude: In Scotland a high and almost continuous ridge of mountains run from the NNW. to SSE. To the east of this ridge of high ground the rainfall is comparatively small, and the climates of all districts not exceeding 500 feet above the sea are dry and suited for the successful cultivation of cereals. To the west of the ridge the rainfall is heavy and the climate moist, and therefore only adapted to the rearing of such stock as West Highland or Polled Galloway cattle.

Mean temperature: The mean temperature of January, the coldest month, is 39° in the west and 37° in the east. The mean temperature of July, the warmest month, is about 64°. Wheat and barley are sufficiently ripened, although the mean temperature of July and August falls as low as 56°.

Summer: Summers have been bad in Scotland for the last seven years, generally cold and wet, with much want of sun. The impression current is that the seasons in Scotland are not as good as formerly.

Winter: Generally raw and open in Scotland, but for some years very wet, with little frost.

Soil: All of the four varieties of soil above mentioned as well as others prevail in Scotland. Agricultural survey and surface mapping of this country has been hithrto little studied. Any approximation, therefore, of the relative proportions of the various descriptions of soils would, it is thought, partake largely of the character of conjecture.

Substratum: The underlying rocks in this district are carboniferous, trap, old red, and alluvium.

Cultivated grasses: Clover: For 1883, 1,502,004 acres. Rye-grass, &c: For 1883, 4,790,032 acres.

SCOTCH BREEDING CATTLE FOR THE UNITED STATES.

REPORT BY CONSUL LEONARD.

As a means of obtaining the most reliable information regarding the kinds of Scotch breeding cattle which are likely to be of use to the stock-breeders of the United States, I applied to William MacDonald, esq., editor of the North British Agriculturist, and he has kindly supplied me with much of the material that forms the basis of this report.

Mr. MacDonald published in the North British Agriculturist an editorial on the subject which gives so fully and clearly the information desired as to breeds of cattle peculiar to Scotland that I adopt it as part of my report and give it below without any material addition:

EDITORIAL FROM THE NORTH BRITISH AGRICULTURIST.

It is difficult to answer the queries of the circular definitely or accurately. There is a lack of data, but approximations can and will be given.

At once it may be conceded that with dairying in the forefront there is only one breed native of Scotland which can be a great object to the American. That, of course, is the beautiful Ayrshire, whose milking properties are second to those of no other race when properly developed, and whose fattening qualities, when dry, are astonishing. In the full flow of milk a cow cannot get fat; but when an Ayrshire becomes yeald she is not difficult to fatten. This cannot be said with so much force of the rival dairy breeds. An Ayrshire steer is a kindly feeder, and becomes good beef, if well kept throughout, at thirty to thirty-six months, with a live weight of from 1,000 to 1,200 pounds. The breed, however, being in such a pronounced manner a dairy one, the number of pure Ayrshire oxen is not large; nor does the breed claim to rank high as beef-makers, though meat of pretty good quality is easily produced by Ayrshires even after they have served their time at the pail. Records of milking tests with Ayrshires should satisfy Americans that, keeping in view their tendency to lay on flesh when dry, there is no breed preferable to it where dairying is the main object, and few, if any, so good.

The average annual yield of milk per cow of the Ayrshire breed is fully 600 gallons. Of course, some animals produce far more than that, but others are less. The return of butter per cow annually has been estimated at about 250 pounds, and of cheese rather over 500 pounds.

With the Polled Aberdeen-Angus, the Polled Galloway, and the West Highland breeds there have not been any reliable or exhaustive milking tests. Those breeds are reared chiefly for beef-making purposes; but many animals, especially of the Polled description, are fine milkers. The three breeds excel in respect of the richness of their milk, but comparative analyses on this point are wanting.

The Aberdeen-Angus, taken as a whole, cannot claim to be more than fair-milkers. A few cows in almost every large herd, in yield of milk, make a decent approach to an Ayrshire—producing between 500 and 600 gallons per annum. A considerable number, however, notably where the animals have been fed hard, as heifers, would not reach more than half that quantity. In these circumstances, it is doubtful if the average would be quite 400 gallons per cow annually. But when you come to the production of beef this breed stands second to none. Indeed, if early maturity is combined with the quality of the meat, it is probably not too much to say that the Aberdeen-Angus has no equal as a butcher's beast among the pure breeds in this or any country. They "die" remarkably well; that is to say, they accumulate a considerable quantity of fat and tallow internally. Then the wealth and texture of flesh are superb.

The weight at maturity varies a good deal. Picked bulls or oxen fattened hard for exhibition scale occasionally as much as 2,700 pounds, and we have seen females of the breed exceed 2,000 pounds. A good average live weight for cows of the breed, as they go to the butcher, is from 1,200 to 1,400 pounds. Bulls generally range from 1,600 to 1,800 pounds. Oxen not intended for competition in the show-yard, but liberally fed throughout, will go to the butcher at the age of thirty to thirty-six months weighing from 1,500 to 1,700 pounds. The great value of the Aberdeen-Angus in a country like America is its potency in crossing with the rougher native breeds. It lends flesh and quality to the lanky, somewhat sharp-topped, ordinary ranch variety.

The Galloway, like the Northern Polled, is a very old breed. It has not the credit of maturing quite so early as the other polled breed, at least it seldom gets the chance. It is as large in frame as the Aberdeen-Angus, but, as a rule, it is not fattened to such an extent; consequently, the recorded weights are rather less for the Galloway. The dairying properties of the Galloway are not high, though many cows of the breed are really good at the pail, and the quality of the milk is excellent. An American critic recently said that the Galloway beat the Aberdeen-Angus in the production of oxtail soup. That may be, but the breed has greater merits than that. It is exceptionally hardy, carries a great quantity of very fine flesh, and is admirably adapted for a wet climate and high exposed country. Galloways have never been so well protected from cold in winter nor quite so generously fed as the Aberdeen-Angus have long been and are. Galloways are so hardy and so much accustomed to exposure that they should be eminently suited for ranching on the great Western prairies. They cross successfully with other meat-producing breeds; a cross between a Galloway cow and Shorthorn bull, for instance, has long been a favorite butcher's beast in the border counties, and commands, when well finished, as high prices as the oft-quoted "prime Scot" in the Southern markets. Next to the West Highland, the Galloway breed is probably the hardiest in Britain.

The West Highland breed is comparatively unknown in America. A few specimens, however, have lately been sent out, and we hope more will follow. Being horned, and sometimes nervous, or vicious even, they are not so easily handled as the Polled breeds or as the Shorthorns, but their unrivaled hardiness and rare quality of flesh would be of service on the American ranch. Their beef is of the richest and most palatable nature, and their shapes and character are grand and pronounced. They would, by judicious mating, reduce the "daylight" and tone down the "timber" of the Texan or Western varieties. Many of the Highlanders are never under cover, summer nor winter, and the death-rate is astonishingly small. The West Highlander will not milk, mature, nor weigh with the Scotch Polled. The milk, however, though short in quantity, is believed to be the richest of its kind in the Kingdom; the beef has the finest of flavors, and is beautifully mixed. They are not usually matured till about four years old, but their ripening properties have not been fully tested. They are fed on more scanty herbage than any other British breed of cattle. If West Highlanders were fed generously from calfhood they would, as a rule, be perfectly ripe at the age of three years, if not before.

SPECIAL STATISTICS CONCERNING SCOTCH BREEDS.

The following information is supplied to assist in properly locating under similar conditions in the United States such foreign animals as have proved by long experience to have been profitable in their native homes:

Name of breed.	Annual average gallons of milk.	Milk to 1 pound of butter.	Milk to 1 pound of cheese.	Live weight.			Age at maturity.	Weight of meat at maturity.
				Cow.	Bull.	Ox.		
		Galls.	*Galls.*	*Lbs.*	*Lbs.*	*Lbs.*	*Yrs.*	*Lbs.*
Polled Aberdeen Angus	400	....	....	1, 300	1, 700	1, 600	2¾	900
Polled Galloway	380	....	....	1, 250	1, 650	1, 550	3	850
West Highland	330	....	....	1, 050	1, 400	1, 250	4	720
Ayrshire	600	2⅓	1⅛	900	1, 150	1, 050	3	620

Name of breed.	Color.	Description.	How long bred pure.	Origin of breed.
Polled Aberdeen Angus	Black	Long deep body on short legs; the finest of beef; rich flesh on small bone; glossy coat; best of beef producers, and fairly hardy.	Nearly a century.	The old Scotch cattle.
Polled Galloway	do	Long haired, deep framed, wealthy fleshed, strong bone, very hardy; suitable for wintering outside.	Over a century.	Scotch races.
West Highland	Black, red, dun, yellow, brindled.	Long horns, long hair, short legs, deep ribs, good outline, somewhat narrow frame, great length, hardiest British breed, winter outside.	Time immemorial.	Obscure.
Ayrshire	Black and white, red and white, brindled.	Short upstanding horns, sharp hind quarters, broad ribs, smooth skin; best dairy breed in Scotland, if not in Great Britain.	For generations.	Uncertain.

Name of breed.	Product.			
	Labor.	Meat.	Milk.	Cheese.
Polled Aberdeen Angus	Good	The finest grained	Rich	Fair.
Polled Galloway	Fair	Excellent rich flavor.	Good quality	Good quality.
West Highland	Untractable	Finest flavor	Rich but small	Fine.
Ayrshire	Scarcely used.	Fair quality	Great in quantity and of fair quality.	Good.

NOTE.—Animals fattened hard from youth for exhibition of the Polled and West Highland breeds arrive earlier at maturity than is indicated above, and attain greater weights, but the estimates given are about average. Cows fed on bean-meal or other special food will give larger returns in milk, butter, and cheese than the above.

In supplement to the foregoing tabular matter, I subjoin further information relative to the Polled Galloway and Ayrshire cattle which, may be deemed of interest.

CHARACTERISTICS OF A TYPICAL GALLOWAY.

I quote from a pamphlet published by the Rev. John Gillespie, M. A., editor of the Galloway Herd-Book of Great Britain (to whom I am indebted for other information contained in this report), as follows:

Statement of the characteristics of a typical animal of the Galloway breed.

[Drawn up by the council of the Galloway Society of Great Britain, 18th April, 1883.]

Color: Black, with a brownish tinge.
Head: Short and wide, with broad forehead and wide nostrils; without the slightest symptoms of horns or scurs.

Eye: Large and prominent.

Ear: Moderate in length and broad, pointing forwards and upwards, with fringe of long hairs.

Neck: Moderate in length, clean, and filling well into the shoulders; the top in a line with the back in a female, and in a male naturally rising with age.

BODY.—Deep, rounded, and symmetrical. *Shoulders:* Fine and straight, moderately wide above; coarse shoulder points and sharp or high shoulders are objectionable. *Breast:* Full and deep. *Back and rump:* Straight. *Ribs:* Deep and well sprung. *Loin and sirloin:* Well filled. *Hook bones:* Not prominent. *Hind quarters:* Long, moderately wide, and well filled. *Flank:* Deep and full. *Thighs:* Broad, straight, and well let down to hock; rounded buttocks are very objectionable. *Legs:* Short and clean, with fine bone. *Tail:* Well set on and moderately thick. *Skin:* Mellow and moderately thick.

Hair: Soft and wavy, with mossy undercoat; wiry or curly hair is very objectionable.

CHARACTERISTIC POINTS OF AYRSHIRE CATTLE.

The second article is quoted from the report of a committee of the Ayrshire Agricultural Society appointed to revise the points indicating excellence in the Ayrshire breed of cattle, as follows:

Proposed ratio scale of points of excellence in Ayrshire cattle.

	Points.
(1) Head short, forehead wide, nose fine between the muzzle and eyes, muzzle large, eyes full and lively, horns wide set on, inclining upwards	10
(2) Neck moderately long, and straight from the head to the top of the shoulder, free from loose skin on the under side, fine at its junction with the head, and enlarging symmetrically towards the shoulders	5
(3) Fore quarters: Shoulders sloping, withers fine, chest sufficiently broad and deep to insure constitution, brisket and whole fore quarters light, the cow gradually increasing in depth and width backwards	5
(4) Back short and straight, spine well defined, especially at the shoulders, short ribs arched, the body deep at the flanks	10
(5) Hind quarters long, broad, and straight; hook bones wide apart, and not overlaid with fat; thighs deep and broad; tail long, slender, and set on level with the back	9
(6) Udder capacious and not fleshy, hinder part broad and firmly attached to the body, the sole nearly level and extending well forward, milk veins about udder and abdomen well developed. The teats from 2 to 2½ inches in length, equal in thickness, the thickness being in proportion to the length, hanging perpendicularly; their distance apart *at the sides* should be equal to about one-third of the length of the vessel, and *across* to about one-half of the breadth	33
(7) Legs short in proportion to size, the bones fine, the joints firm	3
(8) Skin soft and elastic, and covered with soft, close, woolly hair	5
(9) Color red, of any shade, brown or white, or a *mixture* of these, each color being distinctly defined. Brindle or black and white is not in favor	3
(10) Average live weight, in full milk, about 10½ cwt	8
(11) General appearance, including style and movement	10
Perfection	100

JOHN LORNE STEWART (OF COLL),
Convener of Committee.

At the annual general meeting of 19th February, 1884, the above report was adopted, and ordered to be printed and circulated amongst the members and others.

JAMES McMURTRIE,
Secretary,

METHODS OF HOUSING SCOTCH CATTLE.

Polled Aberdeen Angus.—Grazing in summer. Stalls or partially covered courts in winter.

Polled Galloway.—Grazing in summer. Wintered mostly in open air, and partially in court-yards.

West Highland.—Outside through summer and winter. Supplied with hay and some turnips during severe snow storm or frost.

Ayrshire.—Grazing in summer. Kept mostly in byres during winter, with runs out in open weather.

FEEDING SCOTCH CATTLE.

There is very little cake or purchased food fed to any of the breeds, excepting for animals intended for exhibition, or during the last few months of preparation for the butcher.

Rather more extra feeding is supplied to the Aberdeen Angus than to the other breeds, especially in the case of high-bred pedigree stocks.

BREEDING SCOTCH CATTLE.

In the select pedigree herd bulls are kept in the house, and the females are brought to them at the discretion of the owners, having scrupulous regard to the relationship and corresponding features of the animals.

In general commercial stocks, or breeding for the butcher, it is quite common in the case of Galloway, Highland, or Ayrshire cattle, to allow a bull to graze regularly in a park with twenty to thirty females.

HANDLING PRODUCTS.

As regards dairy produce, that obtained from the Galloways and Ayrshires is largely made into cheese, the remainder being chiefly disposed of in sweet milk to the large towns by rail and milk-carts.

The Polled Angus and Highland in most cases foster their own calves and supply milk for the necessities of the various holdings.

A great many of the Ayrshire cows' calves are sent at once to the butcher, while others are fattened at the age of a month or two as veal, but the calves of the other three breeds are, as a rule, brought to maturity at the various ages indicated in the foregoing table.

TOPOGRAPHY OF SCOTLAND.

With reference to the questions of altitude and temperature indicated on the schedule accompanying the cattle circular, I may briefly state that Scotland has been aptly defined as "a great plateau, deeply cut into valleys and having mountains rising to 2,000 or 3,000, and occasionally even 4,000, feet of elevation." The climate is exceedingly variable. From its insular position, however, the cold in winter is not so intense nor the heat in summer so great as in corresponding latitudes in the United States or on the continent of Europe.

The temperature, except in moorlands in the interior and the more mountainous districts, seldom remains long at the freezing point, nor in any part of the country does it often rise to an intensity incommoding the labor of the field. The ordinary greatest range of the thermometer is between 84° and 8°.

While the average temperature generally may be held to range between 45° and 47°, it is noteworthy that it does not descend as the observer moves northward, or to the vicinity or into the interior of the Highlands.

The mean temperature of Scotland, noted at fifty-five stations, altitude 256 feet, during the year 1883, was 45° 9′, and the mean temperature of the city of Edinburgh, with an altitude of 260 feet, for the same period, was 46° 9′.

As to the proportions in which the various soils are distributed throughout Scotland, I find it stated in a work of reference which, although published some years ago, is still valuable in many respects as an authority, that—

	English acres.
The loams amount to	1,869,193
Rich clays	987,070
Gravelly soils	681,862
Cord or inferior clays	510,265
Improved mossy soils	411,096
Alluvial haugh or carse land	320,193
Sandy soils	263,771
Total cultivated land, probably	5,043,450
Total uncultivated land	13,900,550
Total area	18,944,000

or 29,600 square miles. Of this area about 4,000 square miles belong to the islands.

According to the agricultural returns recently published, I find that the cultivated area of Scotland is now estimated to be about 4,800,000 acres.

Regarding the questions of soil and substratum and their conjoint relation to the cattle and the natural feeding products of a district, I would take the district of Aberdeenshire and Banffshire as the best type in Scotland. The cattle from that part of Scotland command the highest price in the London markets, partly due to the breed and partly to the natural feeding facilities possessed. More than one-half of the area is occupied by granite, generally in a decomposed state. This decomposed granite, being rich in alkalies (potash and soda), from the decomposition of the feldspars and mica, forms a soil to which only a proportion of phosphate requires to be added as an artificial manure to raise the best turnip crop in Scotland. The high feeding powers of these turnips, along with the natural clover that grows freely all over the shire, enable the Aberdeenshire farmers to turn out the best-fed cattle in the market.

EXPORT AND PRICES OF SCOTCH CATTLE.

In reply to the memoranda accompanying cattle circular I have to state as follows:

The best method of exportation to the United States is by regular cattle-carrying steamers.

The best animals to export are Polled Angus, Polled Galloway, Shorthorns, and Herefords.

The best routes of export and cost thereof are from London, Liverpool, and Glasgow, on an average of $17 to $24.

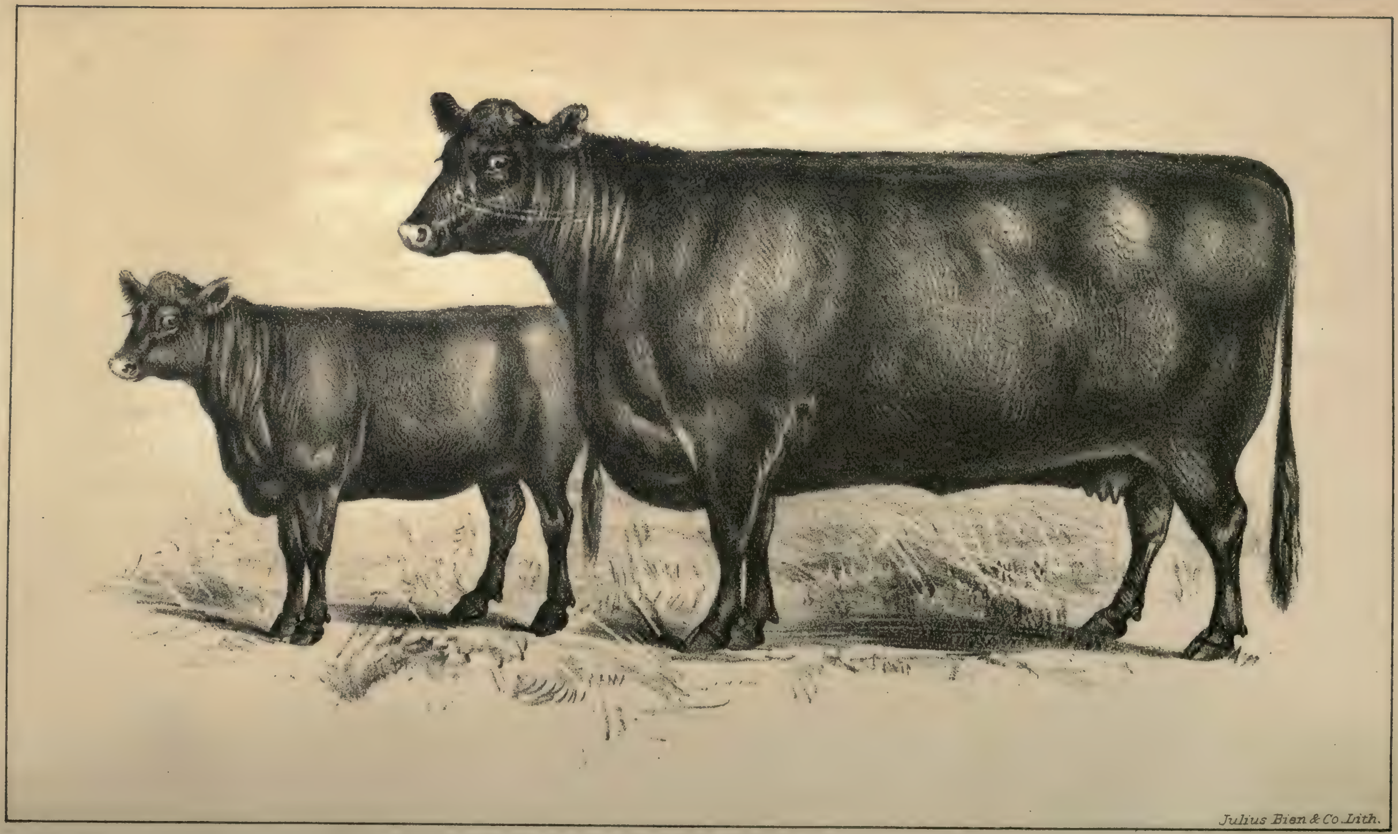
The purchasing prices of the animals are, for good class yearlings: Polled Aberdeen or Angus, £30 ($146) to £50 ($243.33). But individual specimens of the choicer pedigreed Aberdeen or Angus have realized over 500 guineas ($2,554.91). Galloways, £25 ($121.66) to £40 ($194.66), while choice pedigreed specimens of the Galloway breed have likewise fetched long prices. West Highland, £15 ($73) to £20 ($97.33); Ayrshire, £20 ($97.33) to £25 ($121.66).

The estimated expense for attendance and food *en route* is about £1 ($4.86) a head, if ten or more go.

DISTRIBUTION OF SCOTCH CATTLE.

Throughout Scotland Shorthorns are more generally distributed than any of the four distinct breeds peculiar to the country, but these latter

PLATE 68

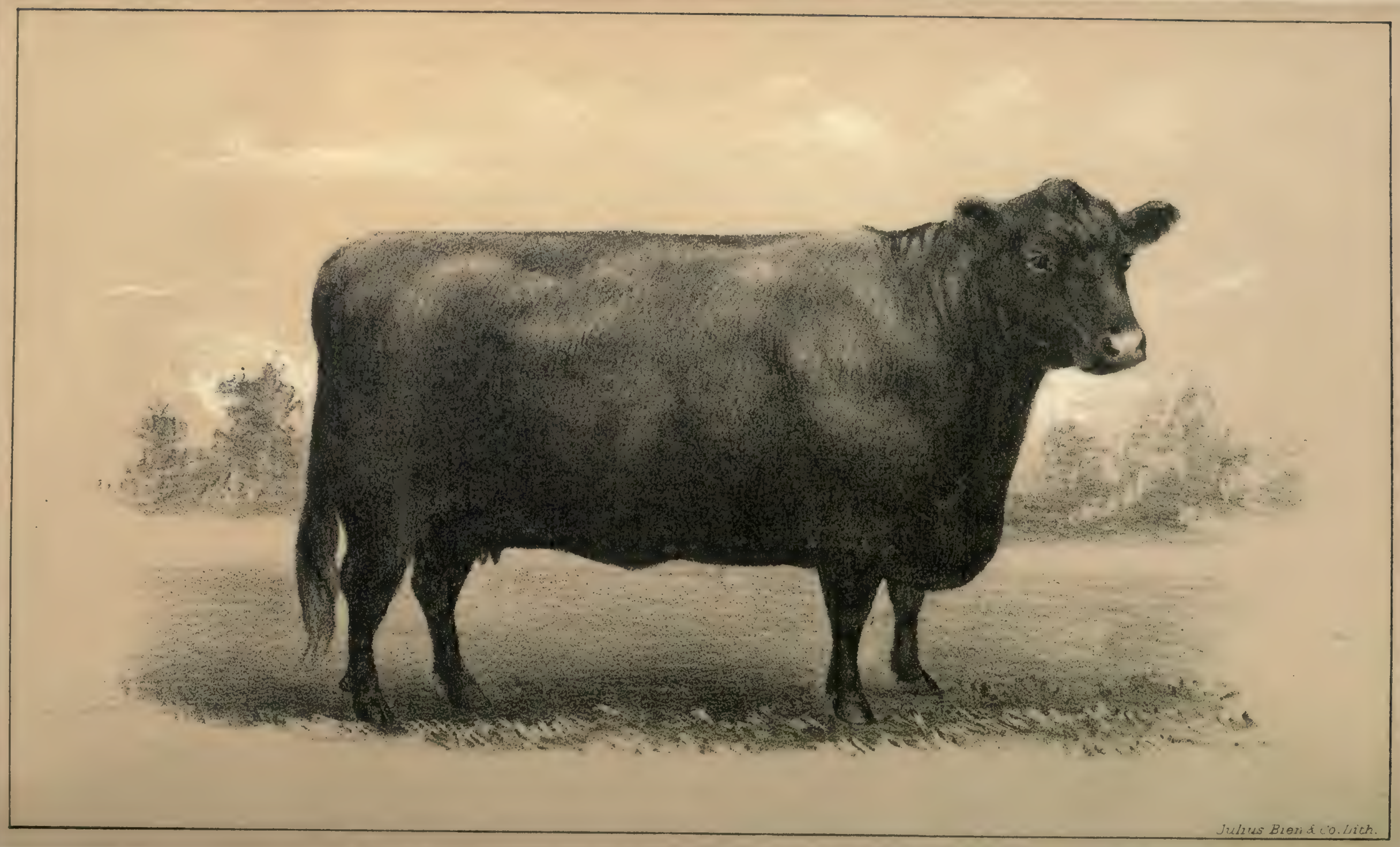


Julius Bien & Co. Lith.

"SYBIL 2ND OF TILLYFOUR" (3526)

FIRST PRIZE COW AT KELSO 1880, AND HER HEIFER CALF SAPPHO SYBIL (5020)
THE PROPERTY OF THE EARL OF SOUTH ESK, KINNAIRD CASTLE, FORFARSHIRE.

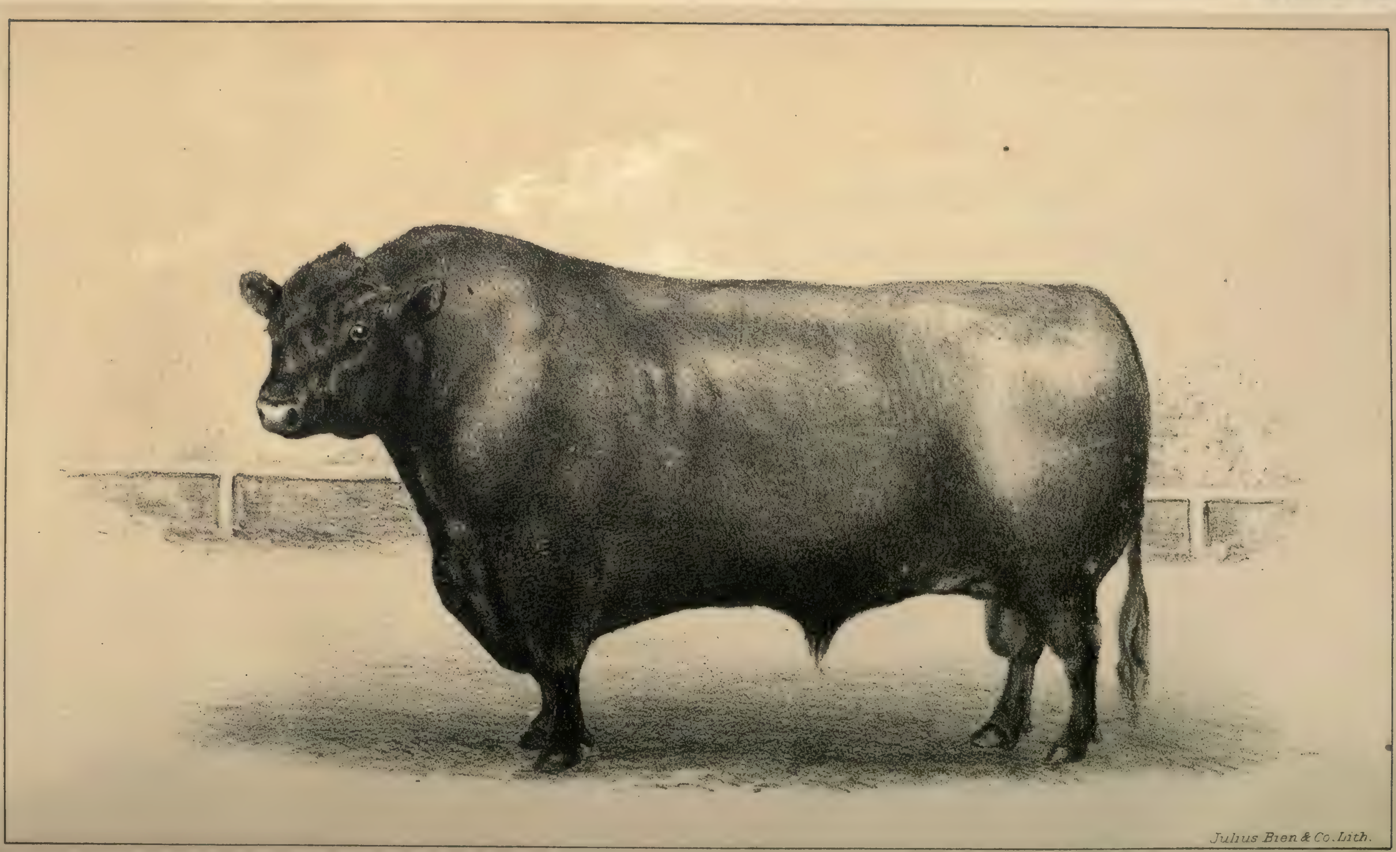
PLATE 67



Julius Bien & Co. Lith.

"JUNO"

BRED BY AND THE PROPERTY OF MR GEORGE MACPHERSON GRANT, BART M P OF BALLINDALLOCH


Julius Bien & Co. Lith.

"SIR MAURICE"

FIRST PRIZE TWO YEAR OLD BULL AT HIGHLAND SOCIETY'S SHOW AT DUMFRIES IN 1878
BRED BY COL. GORDON OF FYVIE THE PROPERTY OF WM JAMES TAYLER, OF GLENBARRY

cover the ground they belong to more closely. The Galloways and Ayrshires may be said to completely cover the southwest of Scotland from Stirling and Dumbarton to Wigton. The West Highland cattle occupy the northwestern counties, and the Polled Aberdeen Angus with Shorthorns, the northeastern counties. Shorthorns are more numerous in the northeastern counties (in the Polled Aberdeen district) and they extend to the southeastern counties.

BREEDING FOR DAIRY AND BUTCHER.

About 15 per cent. of the cattle in Scotland are bred for the dairy and about 85 per cent. for the butcher.

NUMBER OF CATTLE IN SCOTLAND.

With respect to increase or decrease of stock in this country, I may state that according to the board of trade returns, collected on 5th June, 1883, the number of cattle of all ages in Scotland was 1,094,317. This is a slight increase on the figures for 1882, but less than the number returned for 1872, as thus shown:

1872	1,120,593
1878	1,095,387
1882	1,081,246
1883	1,094,317

Nevertheless, there was a slight increase during same time in England and Wales, making the total for Great Britain rather more in 1883 than in 1872.

IMPORTS OF CATTLE INTO GREAT BRITAIN.

England and Scotland are largely dependent on foreign supplies of cattle. The needed supplies are obtained thus:

From the United States: Large numbers weekly of fat cattle, generally of the best quality. These have to be slaughtered at the port of debarkation; also a very large quantity of killed meat.

From Ireland: Heavy weekly supplies of fat, and, in the season, large numbers of store cattle.

Spain and Portugal: About 25,000 to 30,000 head of good class fat cattle weekly.

The northern countries of Europe: Gross number about 5,000 cattle weekly.

Russia: A considerable and increasing trade in dead meat.

Canada: Gross number about 60,000 cattle, of which probably 10,000 to 15,000 bought by farmers to feed.

PORTRAITS OF REPRESENTATIVE SCOTCH CATTLE.

In accordance with requirement expressed in the memoranda above referred to, I have secured portraits of representative cattle of the several breeds, and send them herewith. The list of portraits is as follows:

POLLED ABERDEEN OR ANGUS (by favor of George J. Walker, esq., Portlethen, Aberdeen):
- (1) Bull. Sir Maurice (1319).
- (2) Cow. Juno (3374).
- (3) Cow. Sybil, second of Tillyfour (3526) and her heifer calf Sappho Sybil (5020).

POLLED GALLOWAY (by favor of Rev. John Gillespie, M.D., Mouswald, Dumfries):

(4) Bull. Harden (1151), from oil painting by Gouday Steel, animal painter to the Highland and Agricultural Society).
(5) Cow. Clara (1375).
(6) Heifer. Lalla Rookh (2142).

WEST HIGHLAND (by favor of John Robertson, esq., Old Blair, Bleir Athole):
(7) Bull. Photographed from one of the Duke of Athole's herd.
(8) Cow. Photographed from one of the Duke of Athole's herd.

AYRSHIRE (by favor of James McMurtrie, esq, Ayr.):
(9)*Bull. Baron O'Bucklyire (281) at four years.
(10)*Cow. Bright Smile (1307) at four years.

Those portraits are not uniform and do not indicate the size of each animal relatively to the others, but I believe the relative size of each animal can be estimated by reference to the tabular matter in this report.

Besides the gentlemen whom I have named as having aided me with materials for this report, I am indebted for much of the information contained in it to Messrs. John Swan & Sons, the eminent cattle agents of Edinburgh and Glasgow.

J. A. LEONARD,
Consul-General (lately Consul at Leith).

UNITED STATES CONSULATE-GENERAL,
Calcutta, July 18, 1884.

CATTLE IN IRELAND.

REPORT BY CONSUL PIATT, OF QUEENSTOWN.

RAVAGES OF THE FOOT AND MOUTH DISEASE.

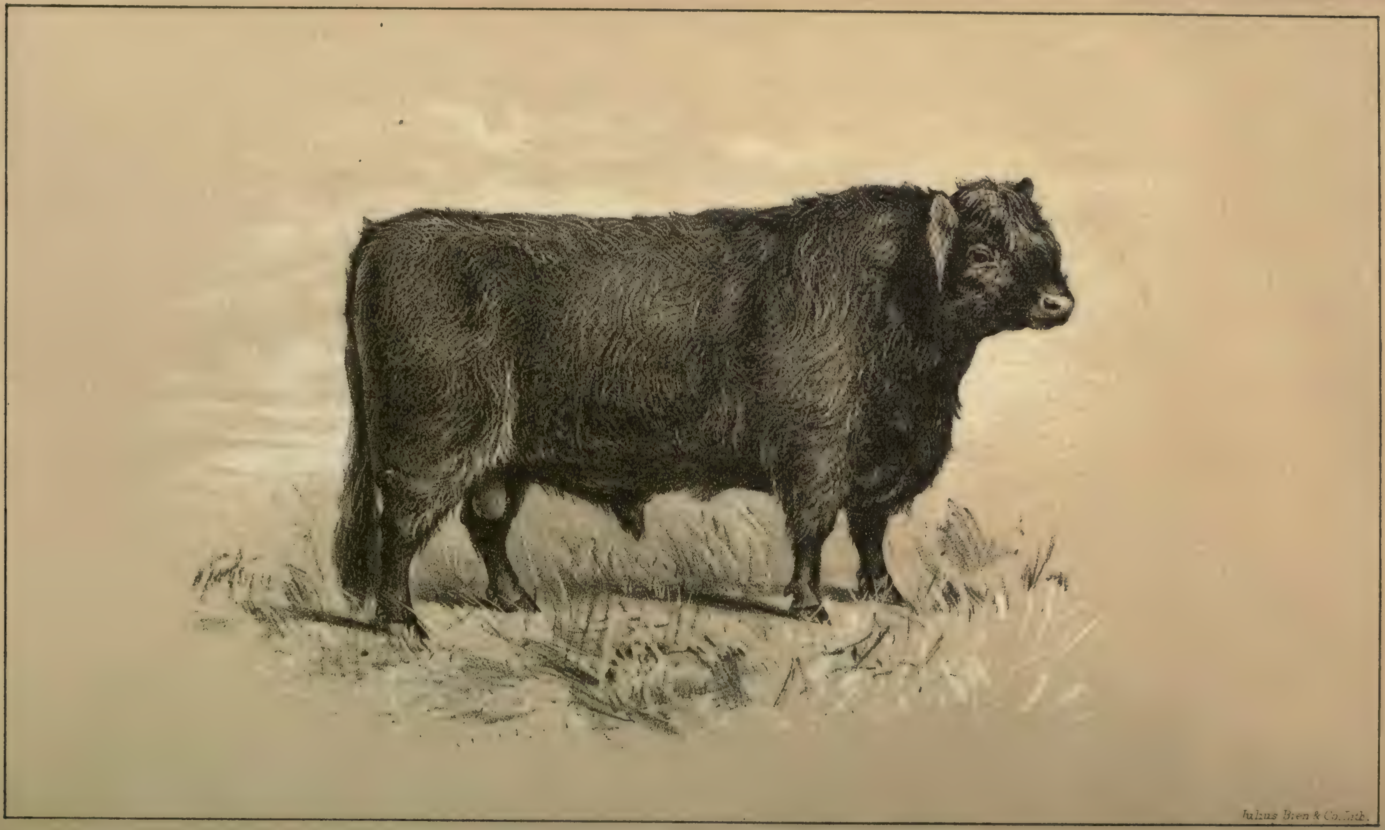
Since receiving cattle circular many letters of inquiry addressed to persons presumed to have the best and fullest knowledge upon the subject of breeding cattle in my district have been written, the answers to which have been few and far between as well as meager. The following statement is made up of information thus received supplemented by personal inquiries which I have caused to be made:

During the past year several districts in Ireland have suffered very severely, owing to the introduction of foot and mouth disease from England. With a view to checking its spread and ultimately "stamping out" the disease, very stringent restrictions were placed upon the cattle trade of the entire island by the veterinary department of the privy council. Fairs and markets were prohibited in many parts of Ireland, and several of the most important shipping ports were closed against exporters. In order to secure open ports in England and Scotland for Irish cattle it became necessary to have cordons drawn around the uninfected districts in Ireland, and no cattle were permitted to be shipped from districts outside those embraced by these cordons. Even cattle inside the cordons could only be shipped on the production of a certificate from the clerks of the poor-law unions, who had means at hand for satisfying themselves that no infected cattle were permitted to leave Irish ports. By this arrangement, and owing to these very crushing restrictions, the important stock-breeding province of Connaught was for a time completely suppressed, all sales of cattle being prohibited except by special license of the lord lieutenant, or else by means of an application to the clerk of the local authority or a justice of the peace.

---

* For portraits of Ayrshire cattle see report of Consul Wells, of Dundee.

PLATE 69

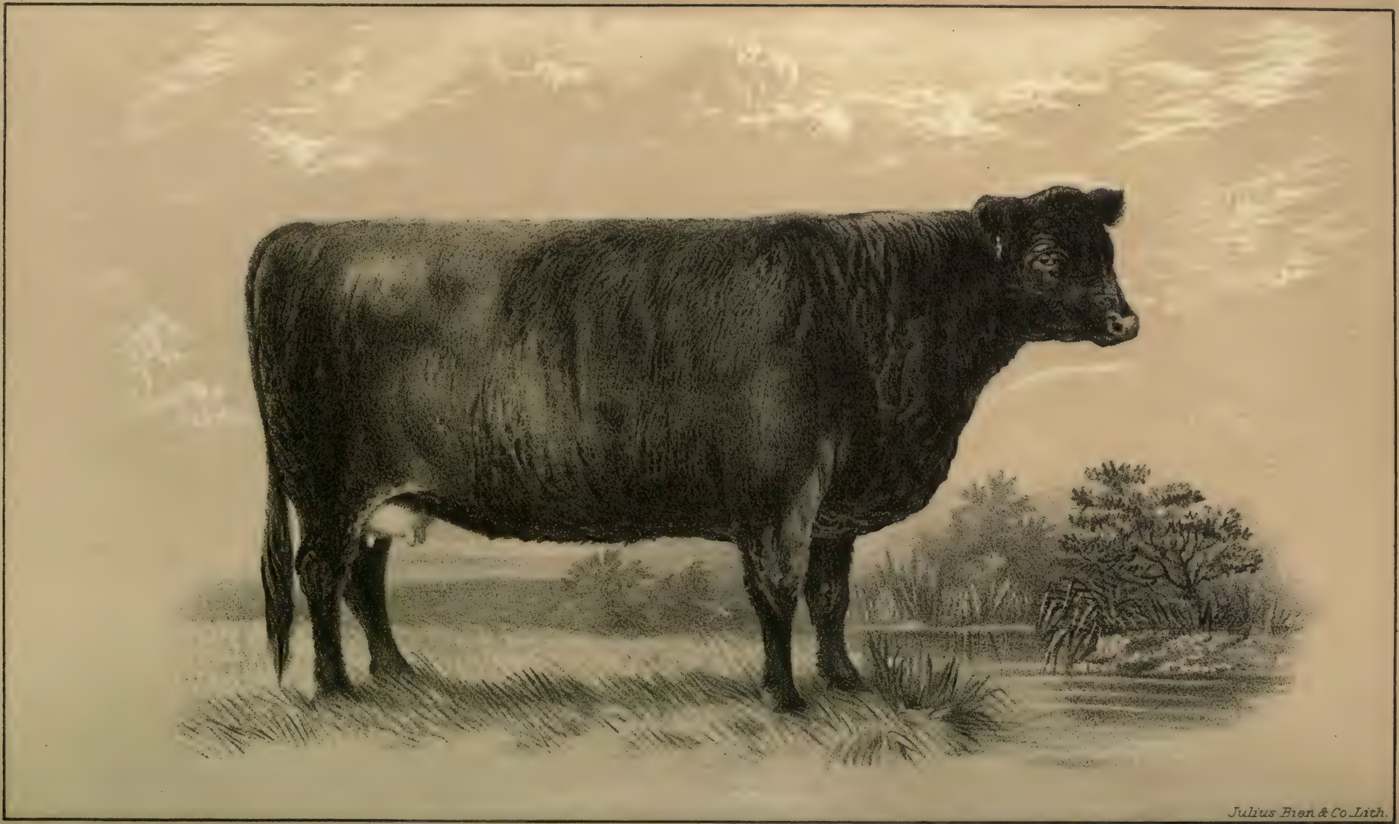


Julius Bien & Co. Lith.

GALLOWAY BULL "HARDEN" (1151)

WINNER OF FIFTEEN FIRST AND SEVERAL SECOND PRIZES
BESIDES GOLD MEDALS AND CHAMPION CUPS.

PLATE 70

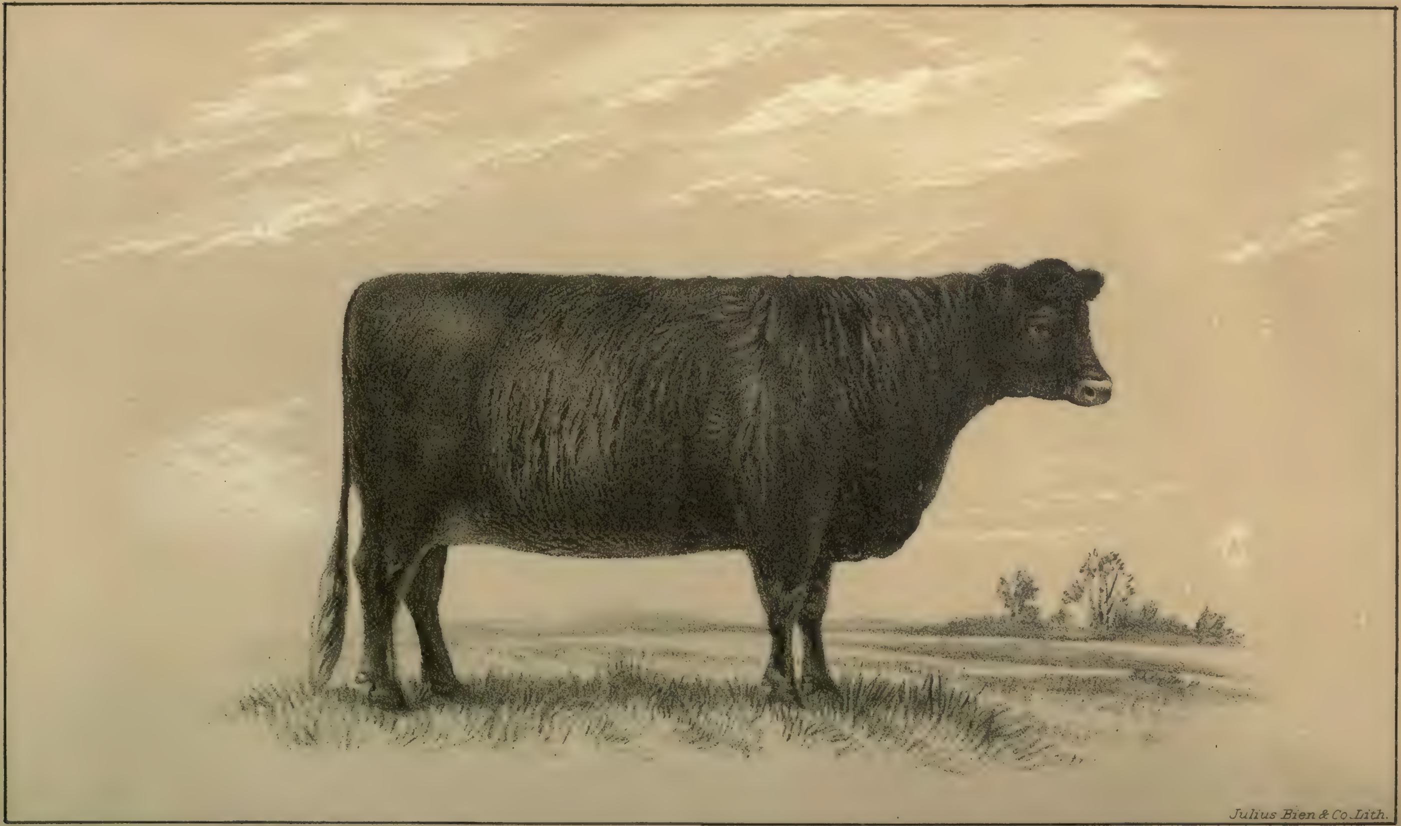


Julius Bien & Co. Lith.

CALLOWAY COW "CLARA"

BRED BY THOS, BIGGAR & SONS, CHAPELTON DALBEATTIE, SCOTLAND.

PLATE 71

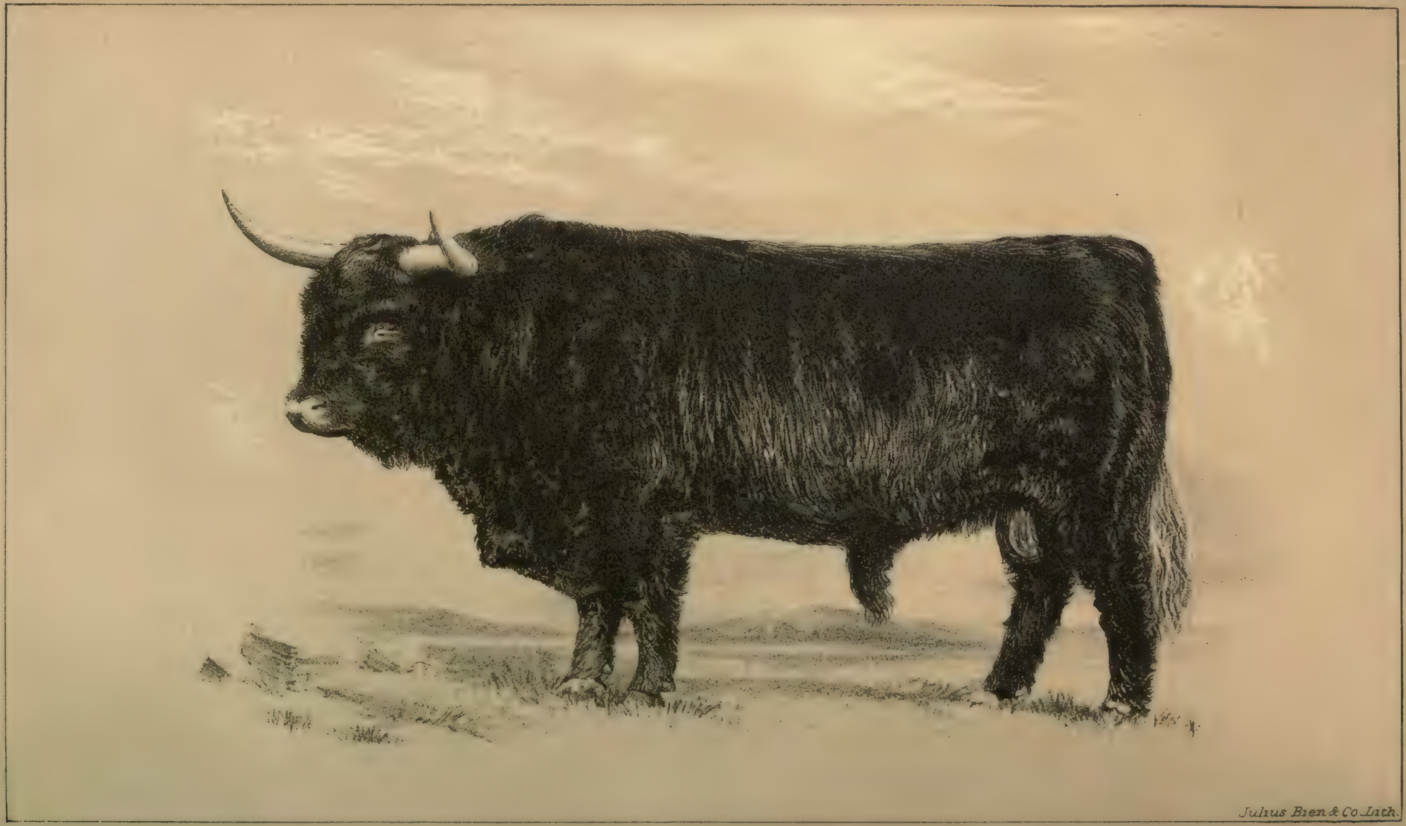


Julius Bien & Co. Lith.

GALLOWAY HEIFER "LALLA ROOKH"

BRED BY THOS, BIGGAR & SONS, CHAPELTON DALBEATTIE, SCOTLAND

PLATE 72

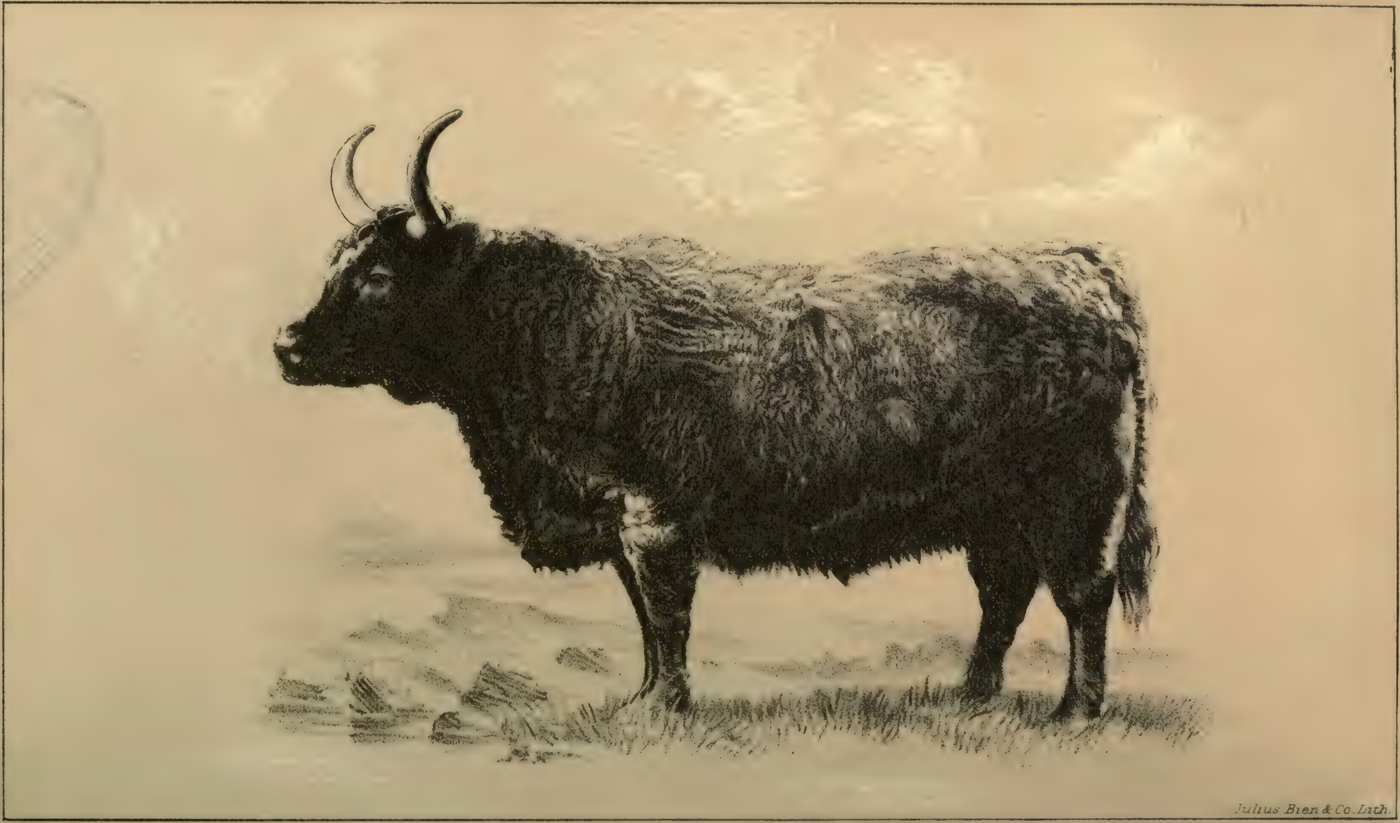


Julius Bien & Co. Lith.

WEST HIGHLAND BULL

DUKE OF ATHOLES HERD

PLATE 73

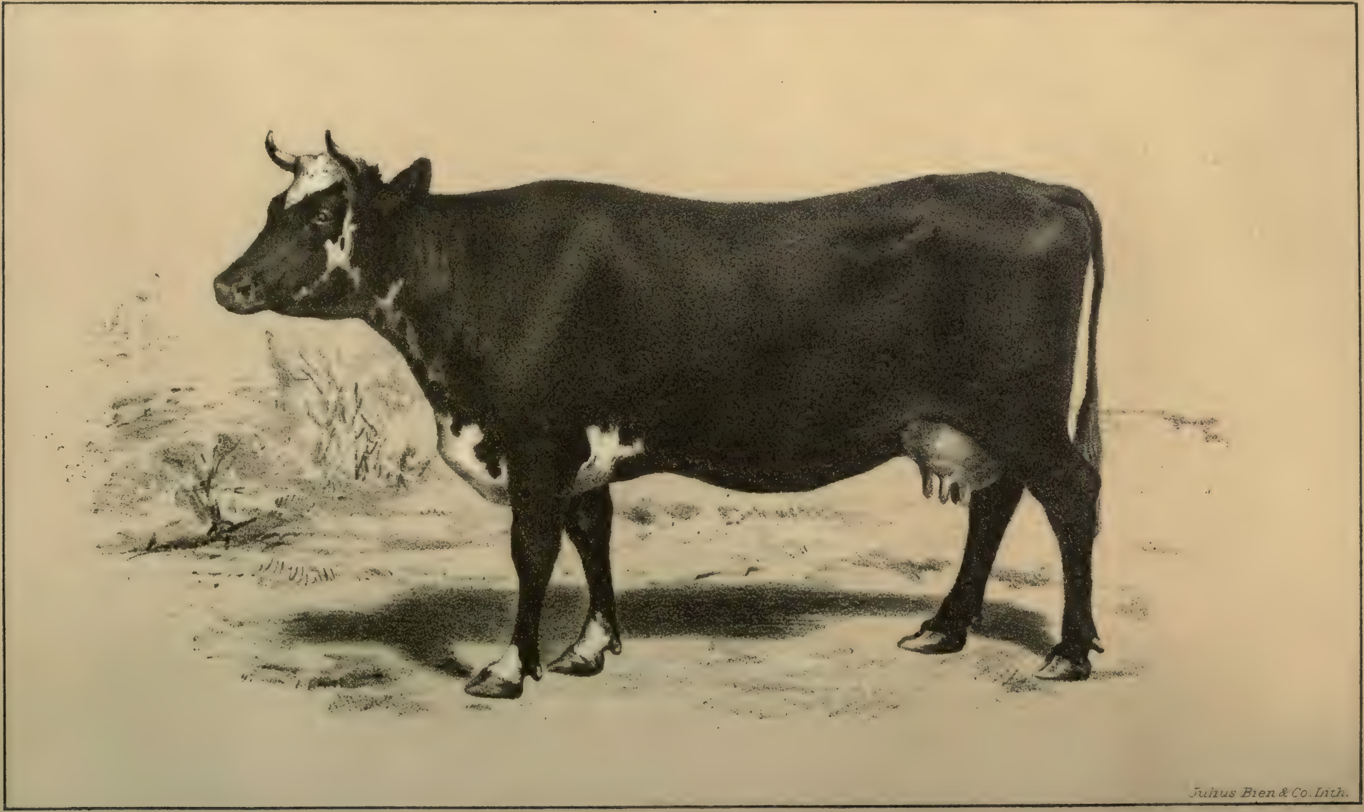


Julius Bien & Co. Lith.

WEST HIGHLAND COW

DUKE OF ATHOLE'S HERD

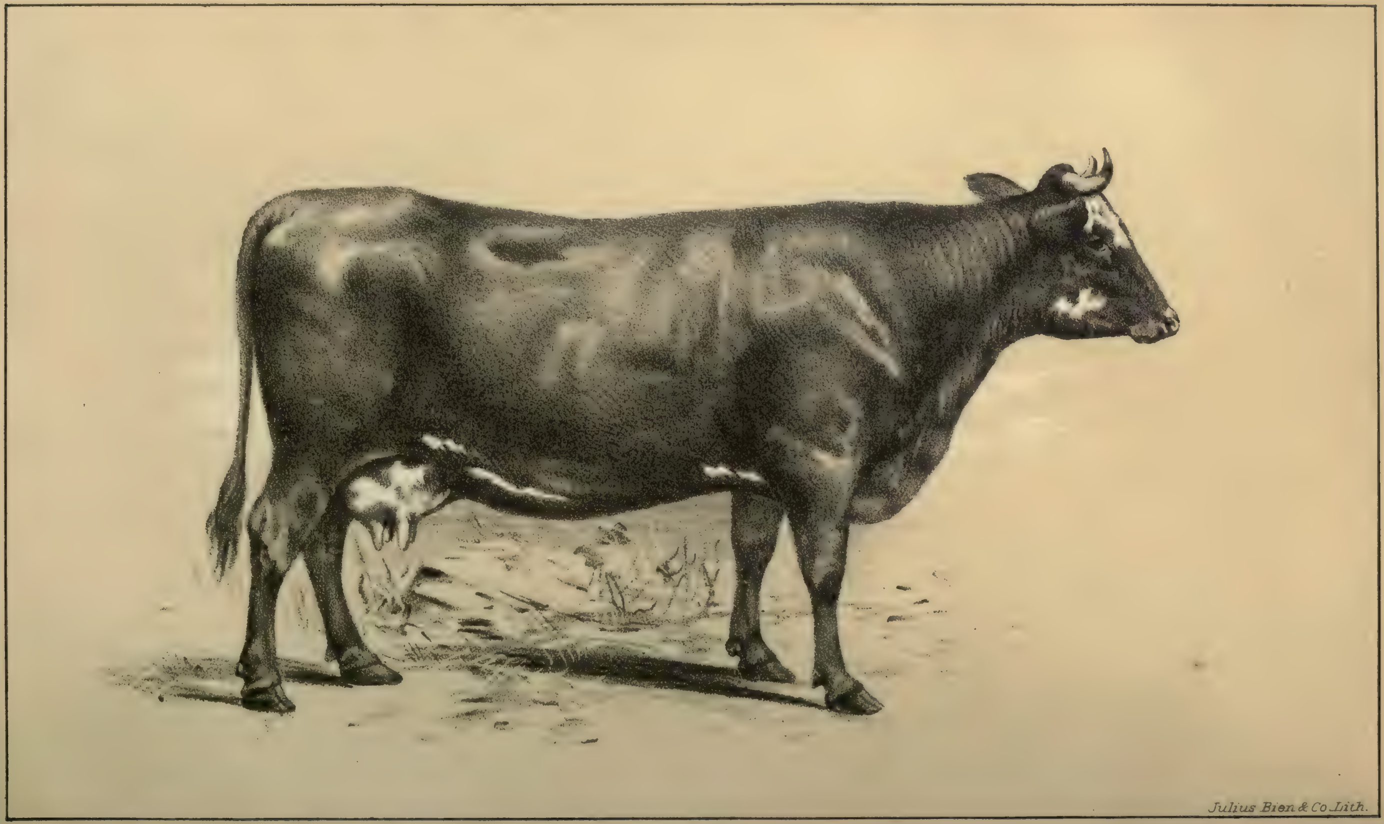
PLATE 74



Julius Bien & Co. Lith.

FLEMISH COW

PLATE 75

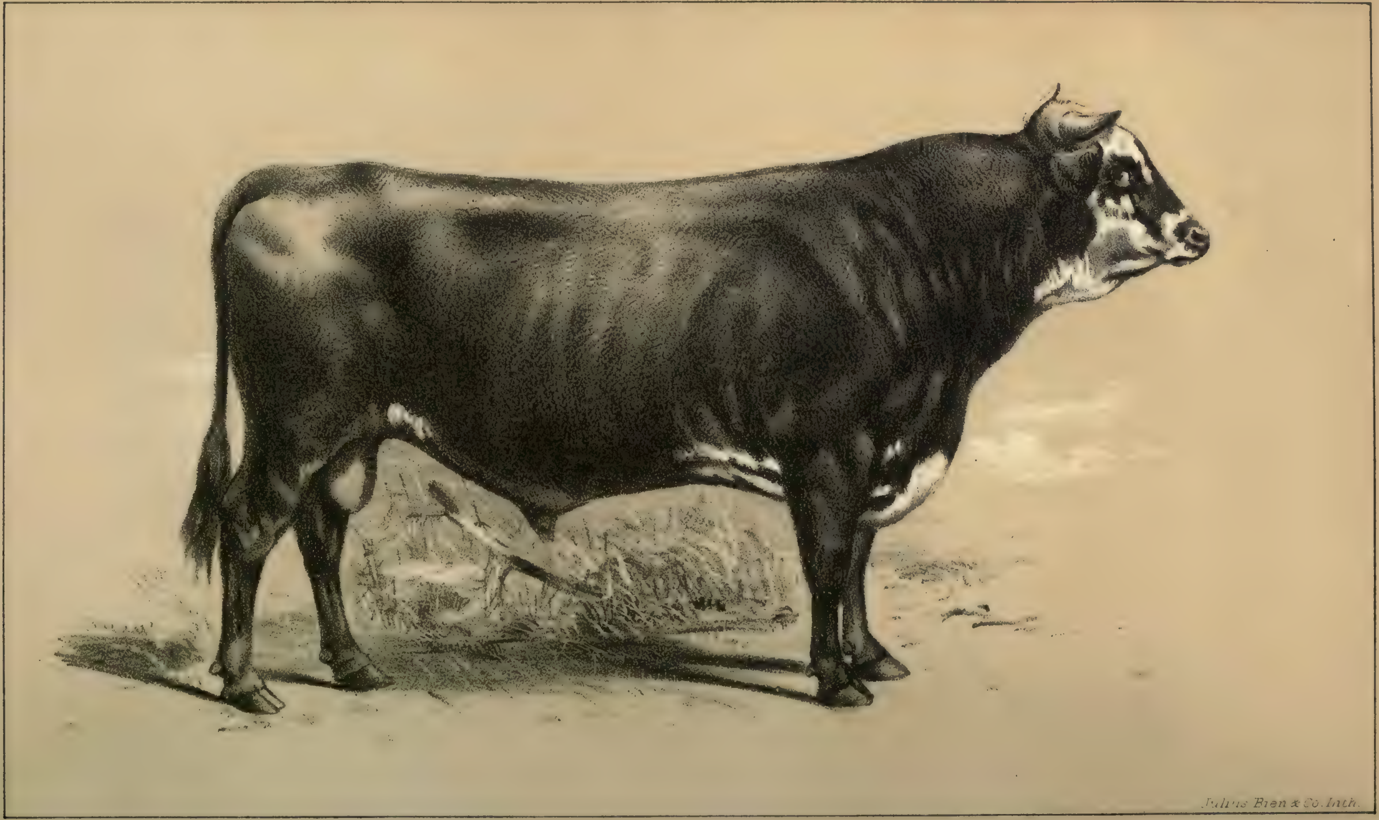


Julius Bien & Co. Lith.

COW FLAMANDE.

6 YEARS OLD.

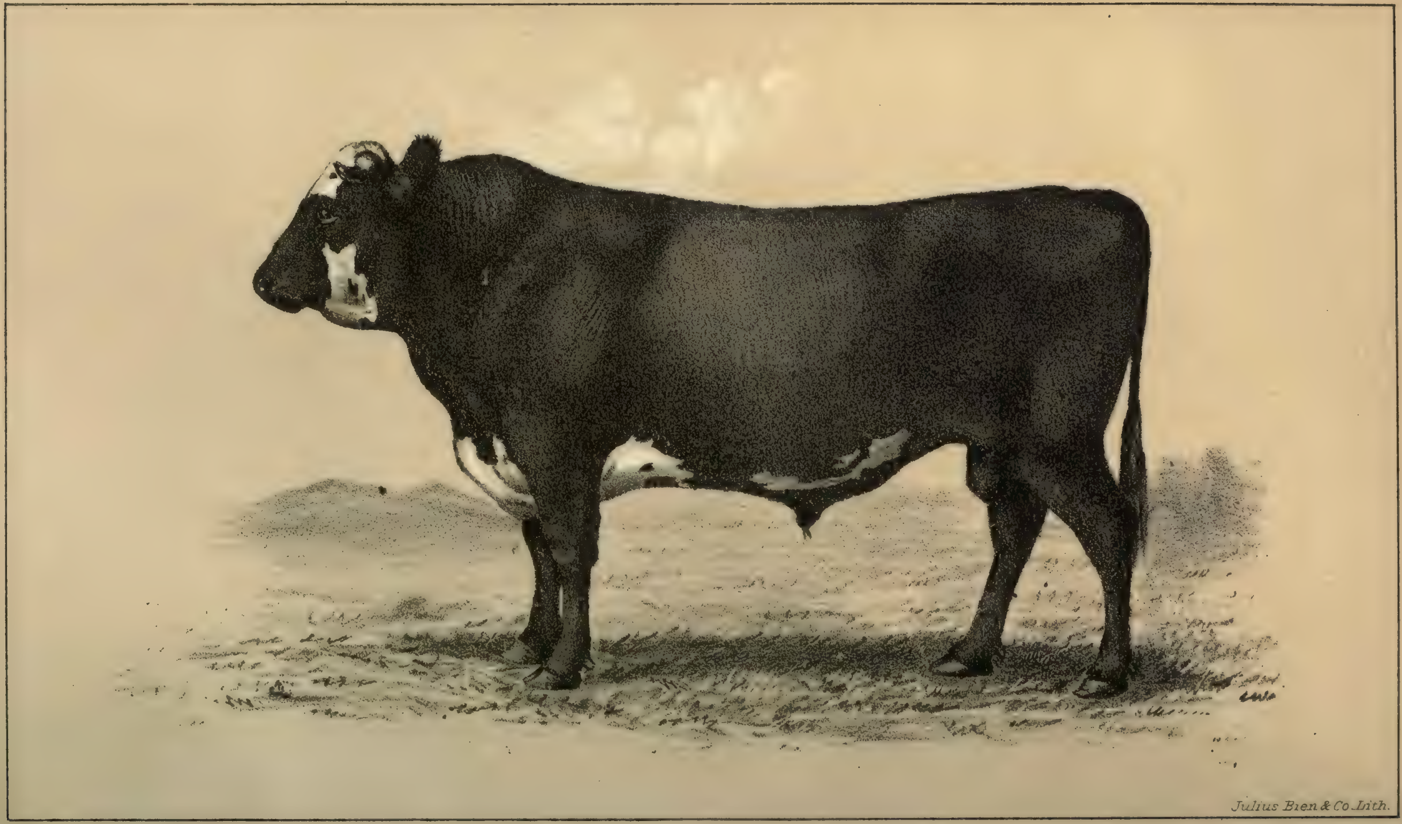
PLATE 76


Julius Bien & Co. Lith.

BULL FLAMANDE.

(30 MONTHS OLD.)

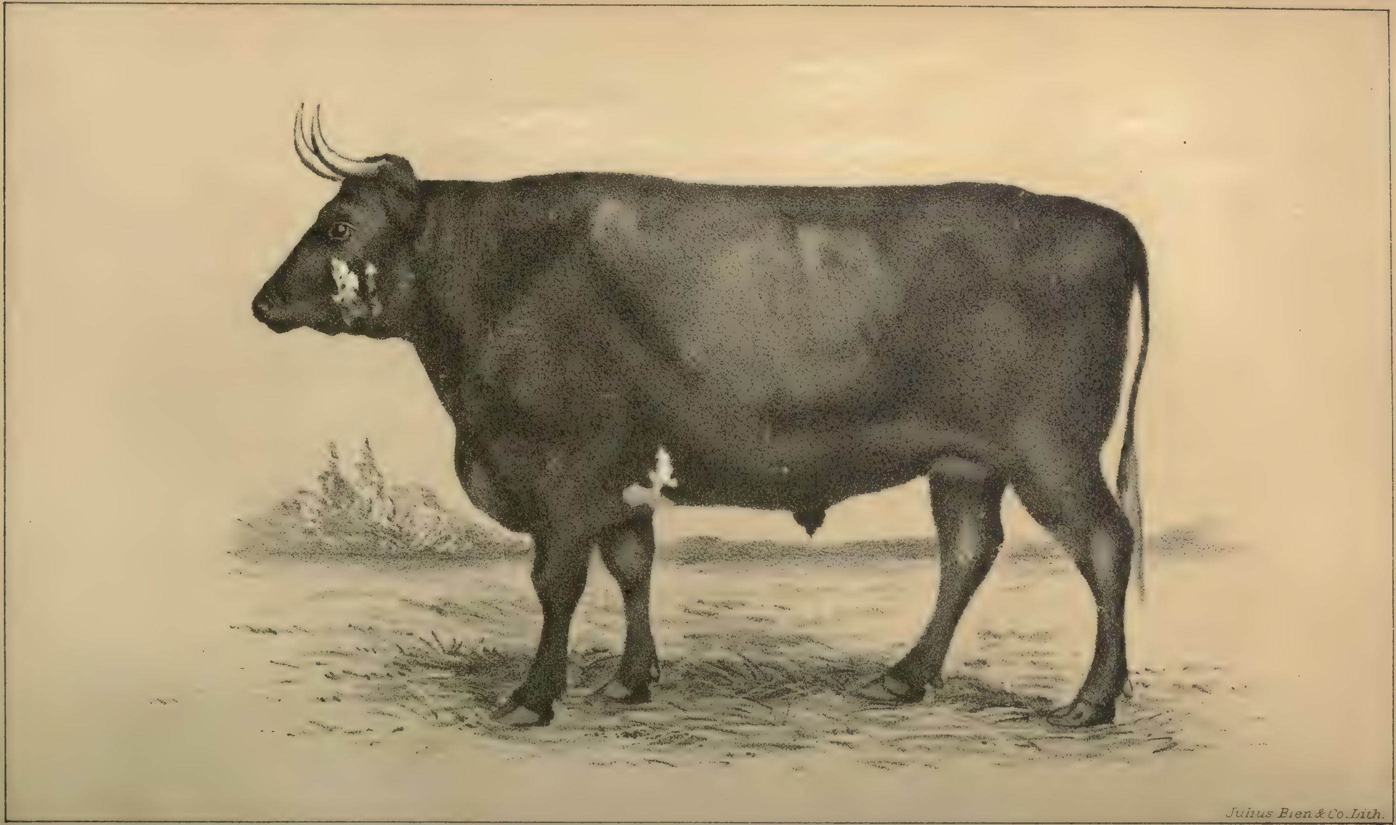
PLATE 77



Julius Bien & Co. Lith.

FLEMISH BULL

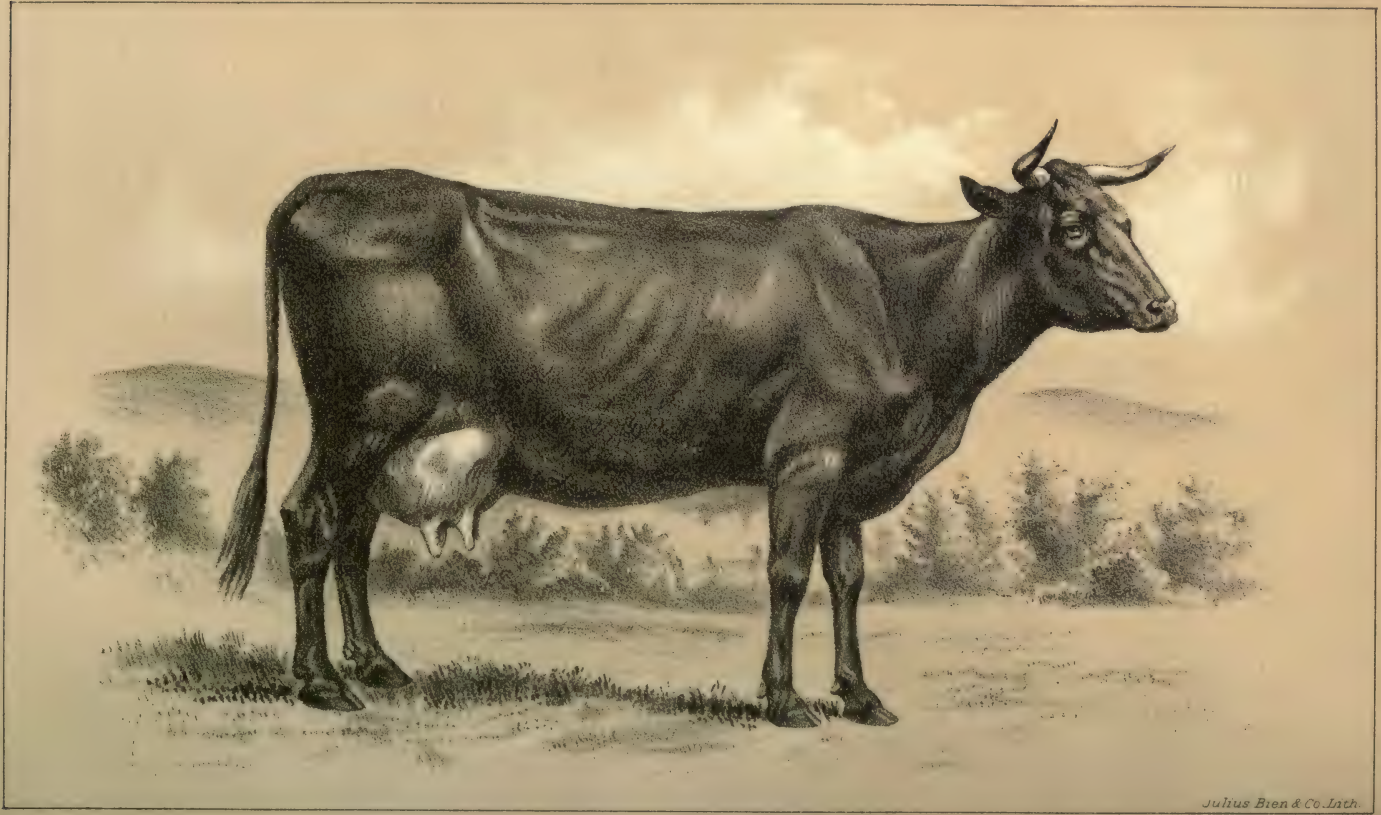
PLATE 78



Julius Bien & Co. Lith.

FLEMISH OX

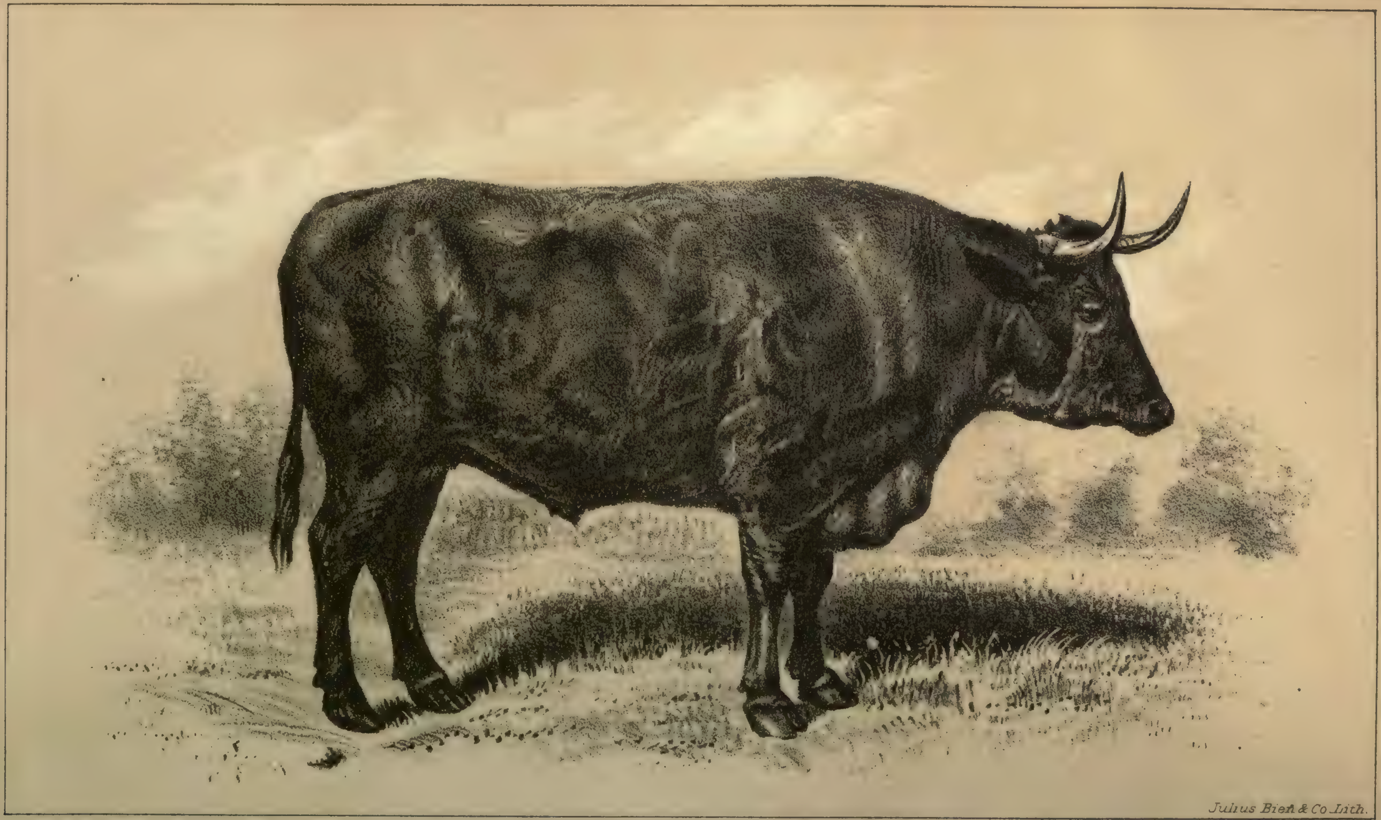
PLATE 79


Julius Bien & Co. Lith.

COW RACE FLAMANDE.

6 YEARS OLD

PLATE 80



Julius Bien & Co. Lith.

DURHAM-FLAMANDE OX.

No order like this has ever before been issued in Ireland, and the effect of the mandate upon small stock-breeders must prove almost ruinous. Some idea of the disastrous effect of these restrictions upon the cattle trade of the entire country may be gathered from the fact that it is in this same province of Connaught that the largest and most important cattle fair held in Ireland takes place. The fair referred to is that annually held in Ballinasloe, and which is always attended by large numbers of stock-breeders from the other three provinces, viz, Munster, Leinster, and Ulster, in search of young stock for fattening purposes. The stopping of the source from which these young stock were obtained cannot but have a very damaging effect on the entire cattle trade of the country.

THE CATTLE TRADE OF IRELAND.

The cattle trade of Ireland is undoubtedly its greatest and most flourishing industry, surpassing as it does by several millions of pounds sterling annually the very important and prosperous linen trade of the northern province (Ulster). For several years past Irish stock-breeders have been receiving from England and Scotland in exchange for live stock an annual average of $73,000,000. The returns for the year just closed have not yet been made out, but it is anticipated that they will prove the most depressing on record, and on a rough estimate the sum realized it is not expected will exceed £8,000,000 or £10,000,000. In the year 1882 there were exported from Ireland to Great Britain 291,777 fat cattle, 430,000 "stores" (lean cattle), and of other descriptions 3,000, or a total of 724,777. During 1883 not more than half this number have been exported, owing to the restrictions above referred to. For four out of the twelve months the export of "store" cattle from Ireland to England was prohibited altogether, and for seven months of the year the restrictions of a general character were so great as to almost extinguish the cattle trade in some portions of the island. The precautions adopted by the veterinary department, however, are having the desired effect; the spread of the disease has been checked, and its ravages have now been "stamped out" of some districts. In proportion as these good results are being realized the restrictions are being removed; but, though a considerable improvement has taken place, the cattle trade of the country is still very much crippled, and it will take some time before it recovers the serious check which it has sustained.

In connection with this part of the subject it will be of interest to draw a comparison between the prices which cattle brought in 1872 and 1883 at Ballinasloe fair. In 1872 first-class oxen (mixed breeds) realized £24 10*s*. ($119.22) per head. In 1875 the same class brought £25 10*s*. ($124.09) per head, while last year these quotations fell to £20 10*s*. ($99.76), and as low as £13 ($63.26) per head for fourth-class animals. In 1872 first-class heifers sold at £20 ($97.33), and last year they brought £22 ($107.06); the quotations for fourth-class animals being £14 ($68.13).

CATTLE CENSUS OF IRELAND.

The total number of cattle of all classes and breeds in Ireland in 1883 was 4,096,021, an increase of 108,810 over 1882. Of this number there were in Leinster 1,066,502, increase 35,330; in Ulster 1,078,049, increase 24,221; in Connaught 623,997, increase 10,815; and in Munster 1,327,473, increase 38,444.

The table which I inclose will show the number and description of cattle in each county of Munster (in which province this consulate has its jurisdiction) during the years 1882 and 1883. Of the different breeds comprised in this return it is impossible to give the proportions, though cattle of mixed breeds largely predominate.

GENERAL INFORMATION CONCERNING CATTLE IN IRELAND.

I return herewith the printed form which accompanied circular of July 18, 1883, with the blanks filled so far as I have been able to obtain the requisite data. Dr. William K. Sullivan, president of the Queen's College, Cork, who is considered the first authority on the subject of inquiry in Southern Ireland, and to whom I am indebted for the principal topographical and scientific facts (including the list of grasses), remarks in sending the same to me:

> Our farmers are so little accustomed to such numerical and accurate details that I assure you it is very difficult to give such information. The details about the breeds of cattle have been given by Mr. James Byrne, J. P., Wattstown Castle, Shanballymore, County Cork, one of the most experienced agriculturists in the county, and one too who had the advantage of scientific training. The information about the geology could, as you will at once see, be only general, and I have accordingly written it across the columns.

Mr. Richard J. Maxwell Gumbleton, J. P., Glanatore, Tallow, County Waterford, a successful breeder and exporter of Shorthorns in Southern Ireland, has been kind enough to furnish some expressions of opinion as well as information on various points referred to in your instructions. Mr. Gumbleton states that the best method of exporting cattle from the south of Ireland to the United States is by shipping them from the ports of Cork or Waterford via Liverpool to any port of our country. There are, he says, very valuable herds of Shorthorns in Ireland, and the bulls from these herds he has no doubt would pay well for exportation to the United States. The only other breed peculiarly good, Mr. Gumbleton says, are the Kerry cattle, which are very pretty (small in size and black) and very good milkers. The Shorthorns in Ireland are altogether bred for dairy purposes, the mixed breeds being reserved more for the butcher. Latterly the breeding of stock in the south of Ireland is on the increase, and the supply is very much in excess of the home demand; in fact the stock-breeders of Ireland live by exporting vast numbers of cattle every year to England and Scotland. It would, therefore, in Mr. Gumbleton's opinion, be highly undesirable to export cattle from the United States to Ireland for dairy uses or for the purpose of the butcher; in fact, sending cattle to Ireland would be somewhat like "sending coals to Newcastle." His experience is that cattle, as a rule, if circumstances be favorable, greatly improve by exportation, and he would willingly use an American-bred bull, if well-bred, and think the fact of his coming from America a good recommendation. He doubts if the imported Shorthorns in the United States are superior to the best herds in England and Ireland, and he strongly suspects there are a greater number of first-class Shorthorns in England and Ireland than there are in the United States. He believes, however, that most breeders would be glad to have a change of blood, provided the animals were well-bred, and he considers such a change would be attended with satisfactory results to all concerned.

Mr. Richard Good, Aherlow, County Cork, an extensive and successful cattle breeder and exporter, has in reply to questions given the following information in connection with the cattle trade:

> The best animals to export to the United States are Shorthorns, and Pedigree Shorthorns can be had as low as £40, and as high as £1,000, or more, each. Kerry cattle are also very good, and these are attracting more attention than they did formerly,

owing to the ease with which they are managed. They are particularly suited to mountainous districts, which would not properly feed Shorthorns. Good Kerrys can be had for £20 each. The best means of exporting cattle from the south of Ireland would be via the ports of Cork or Waterford to Liverpool, and thence by the steamers of the National Line to the United States. The steamers of the National Line being the largest and steadiest, are best adapted for the purpose. As to fodder, hay, oats, bran, and some cake would form very good food for the voyage. The supply of cattle in the south of Ireland is very much in excess of the home demand, and the surplus stock are exported to the midland counties of England and Scotland.

The rate for transportation of cattle from Cork to Liverpool, by local steamers, is about $2.60 per head, insurance extra.

It may prove interesting to note that the total acreage of the province of Munster is 5,934,682, which during the years 1882 and 1883 was utilized as indicated in the inclosed statement.

JOHN J. PIATT,
Consul.

UNITED STATES CONSULATE,
Queenstown, April 3, 1884.

Return showing the number and description of cattle in each county in the province of Munster during the years 1882 *and* 1883.

Counties.	Milch cows.	Two years old and upwards.	One year old and under two years.	Under one year.	Total.
Cork:					
1882	177,621	41,278	63,076	101,309	383,284
1883	175,800	38,601	66,151	109,845	390,397
Kerry:					
1882	103,519	21,725	29,449	51,511	206,204
1883	101,851	20,759	28,891	56,574	208,075
Clare:					
1882	51,604	33,805	34,180	36,564	156,153
1883	54,032	28,634	37,257	44,136	164,059
Limerick:					
1882	96,315	24,484	23,187	59,854	203,840
1883	95,855	23,389	25,566	66,234	211,044
Tipperary:					
1883	81,080	51,199	49,543	60,886	242,708
1883	83,076	52,504	55,748	63,857	255,185
Waterford:					
1882	41,686	13,682	18,701	22,771	96,840
1883	40,958	13,579	19,990	24,246	98,713
Total:					
1882	551,825	186,173	218,136	332,895	1,289,029
1883	551,572	177,406	233,603	364,892	1,327,473
Increase in 1883	....	....	15,467	31,997	38,444
Decrease in 1883	253	8,767	....	....	....

Breeds of cattle in the south of Ireland.

Name of breed.	Annual average pounds of milk.	Milk to pounds of butter.	Height at maturity.			Live weight.		
			Cow.	Bull.	Ox.	Cow.	Bull.	Ox.
		Lbs.	*In.*	*In.*	*In.*	*Cwt.*	*Cwt.*	*Cwt.*
Shorthorn	9,450	38	56	60	64	9 to 14	15 to 23	12 to 20
Kerry	4,000 to 5,000	....	48	50	52	4	5	6
Dexter	3,000 to 4,000	....	50	52	54	5	6	7
Limerick Dairy	8,000 to 9,500	....	54	58	62	9	12	15

Breeds of cattle in the south of Ireland—Continued.

Name of breed.	Age at maturity.	Weight of meat at maturity.	Color.	Description.	How long bred pure.	Origin of breed.
	Yrs.	*Cwt.*				
Shorthorn	5	6 to 9	Red and roan.	This is well known.	100 years.	Imported from Yorkshire and Durham.
Kerry	5	4	Black	Small hardy mountain breed.	Time immemorial.	Aboriginal.
Dexter	5	5	Red	Small breed; good for fattening; not so milky as Kerry.	100 years.	Cross between Kerry and Devon; originated by a man named Dexter.
Limerick Dairy	5	7	Red and roan.	Middle-sized; horns longer than those of the Shorthorns; good milkers.	Time immemorial.	Cross between Shorthorn and ancient dairy breed of the district.

Mean temperature.—Cork, 51.5° Fahr.; Limerick, 49.4°; Waterford, 48.6°. The mean temperature of the southern half of Ireland varies from about 48° in the interior to 52° on the southwest seashore.

Substratum.—The mountains in the south of Ireland are all Silurian and Devonian slates and sandstones. The plain of Munster, which comprises the great cattle districts of Limerick, Tipperary, and North Cork, is mountain limestone. Most of the river valleys also contain mountain limestone. In many parts of the country the underlying rock is covered with deposits of gravel and sandy clay, called by Irish geologists "drift," resulting in part from ice action. These gravels correspond in great measure to the subjacent rock, that is, are "limestone gravels" in the limestone districts, and sandstone and slate gravels, clays, and sands in the Silurian and Devonian districts.

Cultivated grasses.—The following are the kinds of grasses sown in laying down land for permanent pasture: Poa trivialis, roughis, meadow grass; Poa pratensis, smooth-stalked meadow grass; Festuca duriuscula, or hard fescue, a variety of Festuca ovina, sheep's fescue; Dactylis glomerata, rough cocksfoot grass; Solium perenne, perennial rye-grass; Anthoxantum odoratum, sweet-scented vernal grass; Cynosurus cristata, crested dog's-tail grass; Alopicurus pratensis, meadow fox-tail grass; Phleum pratense, common cat's-tail grass; Avena flavescens, yellow oat; Festuca loliacea, a variety of Festuca pratensis, meadow fescue.

[Common red clover and Italian rye are grown for hay, but are cut for soiling in early spring. White clover is generally sown with the grass seeds for permanent pasture.]

Total acreage of Munster and utilization of same during the years 1882 *and* 1883.

Year.	Total extent under crops, including meadow and clover.	Grass.	Fallow.	Woods and plantations.	Bog and marsh and barren mountain land, water, roads, fences, &c.	Total acreage.
1882	1, 246, 394	3, 248, 167	4, 578	111, 415	1, 324, 128	5, 934, 682
1883	1, 212, 170	3, 283, 458	4, 120	110, 991	1, 323, 943	
Increase in 1883		35, 291				
Decrease in 1883	34, 224		458	424	185	

BUTTER INDUSTRY OF IRELAND.

REPORT BY CONSUL PIATT, OF CORK

In my report on the credit and trade system in the south of Ireland published in No. 43 of Consular Reports, I mentioned the butter trade as the principal one identified with Cork.

It has more than once, since I forwarded that report, occurred to me that a special report on the butter industry and trade in Southern Ireland would not only be interesting to our people at large, but might afford some suggestions whereby our many countrymen interested in dairy farming, as well as those dealing in dairy products, would be benefited.

Accordingly, as giving full information regarding the butter industry in Ireland, and especially in the south of Ireland, as well as discussing the relative condition of this local industry as compared with the same industry in other countries, stating the drawbacks under which it labors, and suggesting the proper steps to be taken for their removal and for the improvement of this staple industry of Southern Ireland, I inclose a copy of the evidence given last June, before a special committee of the British House of Commons, by William J. Lane, esq., of Cork.

Mr. Lane has contributed directly to one or two reports which I have heretofore made on trade between the United States and Ireland, &c. He is a gentleman of great intelligence and enterprise, himself a butter merchant of large experience, one of the principal promoters of the Cork Exhibition of 1883, and likely to be widely known henceforth in the politics of Southern Ireland, being one of the newly chosen members of Parliament of the Nationalist party from the county of Cork. To Mr. Lane's statement, which relates to, illustrates, and discusses the dairy and butter industry at large, I add a report on the butter trade of Cork, explaining the advantages of the climate and soil in Munster for the production of butter, presenting various interesting statistics in connection with the local butter manufacture and trade, describing the customs and methods of the Cork Butter Exchange, giving the price of butter for a long series of years, &c., specially prepared and furnished for my use by T. J. Clanchy, esq., another prominent butter merchant of the city, who is mentioned in Mr. Lane's statement, and who is particularly identified with the trade in canned butter. Mr. Clanchy has obtained gold and other medals at the Paris, Calcutta, and Melbourne Exhibitions, during recent years, over all competitors, for his hermetically sealed canned butter, and contributed to the consular exhibit from this district last year at New Orleans a full display of his goods, which I think must have attracted the attention of such visitors as were interested in the dairy products of the United States.

In connection with the subject of canned butter, it may be well to direct the attention of those in our country so interested to the opportunity which, I am told, exists for a large development of American enterprise with respect to this class of butter.

Within seven or eight years France, Germany, and Denmark have, by the adoption of the system of packing butter in hermetically sealed cans, each containing 1, 2, 3, 7, 14, or 24 pounds of butter, secured the entire, or about the entire, trade of supplying the ships of the world. I believe that the American creamery butter is eminently suitable for this particular branch of the export butter trade. If this butter were packed and sealed in cans similar to those exhibited by Mr. Clanchy, which preserve the butter fresh and sweet for a long period in any climate, immediately on being made at the creameries, nothing, so far as I can see, is to prevent its use in supplying the immense foreign shipping trade of our country.

Whereas all vessels going from Europe to America take with them a supply for the double voyage, it would be quite practicable, if this enterprise were introduced in the United States, to secure the entire business for American exporters. In my opinion our countrymen would be able to compete most successfully with European countries for this trade, inasmuch as all dairy products can be raised so much cheaper in the United States than at this side of the Atlantic.

For the large passenger steamships the finest butter is utilized, and also for export to countries where the consuming population require, and can afford to pay for it, such as India, Japan, China, Australia, the South American countries, and those bordering upon the Mediterranean.

For merchant shipping, and for the lower or poorer classes of the population in the above-named countries, a second and third quality of butter is good enough, and it is for the inferior qualities the United States, it would appear from the published market reports, require a greater outlet than for the products of the best dairies, inasmuch as the American markets are constantly glutted with unsalable surplus stock of lower grade butter, chiefly owing to the inroads which the improved manufacture of butterine has made upon the markets hitherto available for the consumption of cheap genuine butter. Since merchant vessels use chiefly butter of the third quality, it will be seen that a market for large quantities of this class of butter might be found if the canning system were adopted for the supply now furnished for the most part by European exporters.

Within a few years past two Irish houses have adopted this system of tinning butter, and their efforts have been crowned with great success, although their combined shipments are so small that it does not contradict my general statement that France, Germany, and Denmark monopolize the trade. The two Irish houses referred to are those of Messrs. Clear and Sons, and Mr. Clanchy, who furnishes the accompanying interesting report. The latter shipper, at much trouble and expense, gave his fellow-tradesmen in the United States an opportunity of inspecting for themselves the way in which the tinned butter trade in Ireland is worked, by the exhibit at New Orleans already mentioned.

In my report on the credit and trade system, I explained the method by which transactions are regulated between the producers and the butter brokers in Cork market.

It may be worth while to quote that portion of said report; it is as follows:

> In the beginning of the year the butter brokers of Cork market advance loans to the farmers to the amount of two-thirds of the value of their butter produce for the year, at rates of interest varying from 6 to 10 per cent. With this money the farmer pays his rent, buys stock and seeds; according as he makes his butter he sends it to the broker to pay off his debt.
>
> The brokers borrow the money so advanced from local banks, at a lesser rate of interest than they charge. When they receive the butter from the farmers they sell it to the exporters for prompt cash, and the exporters ship to English merchants, giving one and two months' credit for the payment.

The export of butter is a different branch of the trade conducted by a different set of merchants, who, on receiving their orders from their foreign correspondents, go to the Cork Butter Exchange daily and buy the brands they require at the open competition which takes place, as explained by Mr. Clanchy, at 11 a. m. each day; and they resell to their customers at a fixed regulation commission of 2*s.* 6*d.* (or 60 cents) per hundredweight over the published Cork market price of that date. This commission includes buying, selecting, carting, coopering, and shipping. Out of this commission they allow buyers a discount of two months at 5 per cent. (*i. e.*, 2*d.* per pound sterling, or 4 cents per $4.87) for prompt cash payments, or they draw a bill on the purchaser at two months after date for the net amount of the invoice. Unlike the American shippers they give the butter to the buyer before they receive either cash or bill, and frequently they have to regret this system of trading, as their customers often become bankrupts and completely evade payment for the goods purchased. Having observed the system here and in the United States, I am inclined to believe that the latter is the better and safer, since it requires the drafts to be paid by the consignees before they obtain possession of the bills of lading, and consequently before they get possession of the goods.

JOHN J. PIATT,
Consul.

UNITED STATES CONSULATE,
Cork, October 29, 1885.

THE BUTTER TRADE OF CORK.*

The staple product of the South of Ireland is butter. The province of Munster, of which Cork is the chief city, is essentially and before all other things a butter-producing country, for which it possesses a remarkable combination of natural advantages not to be found together elsewhere. The essential conditions for making good butter, are: (1) A mild, equable climate, not too hot in summer and not too cold in winter. (2) A sufficient rainfall to promote an abundant growth of grass. (3) A good firm soil, not over-rich. Fine butter cannot be made in an excessively hot climate, and of course snow and frost, that cover and bind up the pastures for a considerable part of the year, render its production in quantity impossible.

Grass-fed butter will always be the best, and the country where the cattle can be fully grass-fed in the open air for the longest period of the year is that in which most butter of good quality can be produced.

The climate of Munster is rendered singularly even in its temperature by its geographical position. Its coast line extends over nearly the whole southern end and a large portion of the western side of the island, receiving the first influence of the great warm ocean current, the Gulf Stream, which acts as an equalizer of temperature, a sort of governor, preventing the winter from being too cold and the summer from being too hot. The warm vapors floating over the land in winter raise the temperature, and by forming clouds and rain in the summer prevent excessive heat.

The winters are much milder than in other countries of the same latitude. Occasionally a winter passes without sufficient ice to give even one day's skating.

The rainfall is very great, and combined with the mildness of the seasons causes an abundant growth of grass for a large part of the year. A great proportion of the pastures are on undulating uplands, the configuration of which lends itself to rapid irrigation, the water running off the slope and leaving the grounds sufficiently moist without morass or sponginess.

The pastures in those upland districts are not over-rich, but good, sound, friable soil, producing sweet, crisp herbage, the butter made from which possesses great keeping properties and a peculiarly delightful taste, the true butter flavor, so dear to those who know and can appreciate it, the absence of which is to be noticed in many of the continental butters, and in some Irish butters made off very rich lowland pastures.

It is found that the excess of fat or oil made off deep rich soil makes them more liable to turn rancid, and reduces their keeping qualities, and that such butters, however good they may be for immediate use, are not so suitable for preserving or for export to hot climates as the butter from the well-drained upland districts and the lighter but good soils which prevail to a very large extent in Munster. Even from the richest lands of Munster, such as the celebrated Golden Vein, a well-defined belt of land which runs through the province and which is considered to be almost unsurpassed in the world for its fine quality, the soil and climate are so favorable that the butter, although perhaps more suitable for high-class mild-cure make, still possesses considerable keeping powers when properly preserved, although not to the same degree as the produce of the lighter pastures.

---

* This report was prepared by Mr. T. J. Clanchy, a Cork butter merchant.

The following is the return of acreage under grass meadow and clover in the four provinces of Ireland in 1884:

Provinces.	Acres under meadow and clover.	Acres under grass.	Total acres under meadow, clover, and grass.
Leinster	594, 697	2, 684, 132	3, 278, 829
Munster	591, 697	3, 293, 445	3, 885, 142
Ulster	492, 794	2, 313, 248	2, 806, 042
Connaught	283, 542	2, 055, 483	2, 339, 025
Total for all Ireland	1, 962, 730	10, 346, 308	12, 309, 038

The total quantity of arable land in Munster in 1854 was 4,730,840 acres, of which 3,885,142, or 82 per cent., was under pasture, besides which a large proportion of the arable land was devoted to growing roots and fodder for the winter feeding of stock. Suitability of soil and climate would not, from the butter-producers' point of view, be of much use without a supply of milch cows, and in this respect the province of Munster is well provided. According to the annual Government returns of live-stock for 1885, the number of milch cows in each of the four provinces of Ireland is returned as follows:

Leinster	238, 636
Munster	549, 578
Ulster	190, 871
Connaught	438, 396
Total for Ireland	1, 417, 481

From which it appears that Munster has more than one-third of the milch cows of Ireland.

The returns of live stock in England for the year 1884 show that the number of milch cows in that country was 1,715,275, and in Scotland 408,745, so that Munster contains very nearly one-third as many milch cows as the whole of England and considerably more than all Scotland.

Taking the return of live stock in Ireland and in other European countries, I find the following to be the result:

Number of live stock and population in the following countries.

Date.	Countries.	Live stock.	Population.
1883	Great Britain	5, 962, 779	29, 710, 012
1883	Ireland	4, 096, 021	5, 174, 836
1880	Belgium	1, 382, 815	5, 536, 654
1880	France	11, 446, 253	37, 321, 186
1873	Germany	15, 776, 702	45, 234, 061
1881	Holland	1, 434, 406	4, 114, 000

From this it appears that while Great Britain has only 20 head of live stock to each 100 inhabitants; Belgium, 25; France, 30; Germany, 35, and Holland 35, Ireland has 79 head of live stock to each 100 people, and in the province of Munster the proportion of live stock to population is even greater, the live stock being 1,364,470 and the population 1,331,115, or over 100 live stock to each 100 inhabitants.

In Ireland cattle have to a great extent replaced human beings. The population of Ireland in 1841 was 8,175,124, while in 1881 it was reduced to 5,174,836, a shrinkage of over 3,000,000. The conditions that have brought about this remarkable change, a change which is unparalleled in peace or war, in any country in the history of the world, are well worthy of the thoughtful study of statesmen and economists. Whether this result is the outcome of state policy in the past, or of the accidents of geographical environments, laws, and social system, it equally suggests Goldsmith's celebrated lines, which, by substituting "live stock" for "wealth," apply to it with remarkable aptitude:

Ill fares the land, to hastening ills a prey,
Where *stock* accumulates and men decay.

The bearing, however, of these figures on the question of the butter supply, is that they show that Ireland has a larger proportion of its butter to export, and less people at home to consume it, than any other country, an additional proof of the great importance of the Irish butter industry to commerce.

The city of Cork, the capital of the province, is the natural outlet for the greater portion of the butter produced in Munster, owing to its central position, its unrivaled harbor of Queenstown, and its direct communication by roads and railways, which tap the principal butter-producing districts. A butter market has been held in Cork for a very long time, and in 1769 it was placed under the management of a committee of the principal merchants, under whom it remained for one hundred and fourteen years, until the present year, when a special act of Parliament was passed, transfering its management to a body of trustees, with power to make by-laws for its regulation.

The quantity of butter which passes through this market is enormous. In the first year, 1769, of the record, 105,309 packages passed through the market, and the annual quantity has since largely increased, being now considerably more than three times as much.

The largest quantity received in any one year was in 1878, when 434,239 firkins passed through the market.

The Cork butter market is held every day, Sunday and a few holidays excepted, and the sales on a single day have been as large as 3,800 firkins of about 75 pounds net, which, when prices were high, would be value for about £12,000 sterling ($58,398.) All the butter has to be cleared away within the day to make room for another large quantity coming by road and rail for the next day's market. The system of selling butter in the Cork market is peculiar to this market. At a quarter before 11 a. m., buyers and sellers assemble around a table, and at the first stroke of 11 all buying must be concluded, and the whole quantity of butter, frequently some thousands of firkins, has changed hands. To the uninitiated the buying and selling at this table appears to be a perfect Babel, which can only be understood by the brokers and exporters, who keep up a perfect cross-fire of offers and bids until the stroke of the clock at 11, when suddenly all the noise ceases, buying and selling are over for the day, and the buyers proceed to cart away their purchases. The firkin butter is inspected and classified by sworn judges, and all the bargains at the table are made for the various qualities of butter so classified. This applies only to the officially classified butter, but there is now also, since the passing of the recent act of Parliament, an open market, where butter is bought and sold on the judgment of the buyers and sellers themselves, without any official classification.

There is another branch of the trade which is of great importance—that of preserved butter in hermetically-closed cans. Up to very recently there were certain restrictions placed on this branch of the trade in the interest of the dealers in firkins, and, although Irish butter, from its great keeping properties, is, perhaps, the most suitable of any in the world for preserving, this important branch of the trade was allowed to go into the hands of the Danish and French packers, who had several years' start of the Irish tinned-butter preservers, and got possession of the various foreign markets. It is gratifying to be able to state, however, that within the last few years, since the Paris Exhibition of 1878, the Irish canned-butter trade has greatly extended, and has been particularly active in the last two years.

In 1878 the writer of this paper exhibited Irish butter preserved by a special process at the *Concours*, open to all nations, held in the Paris Exhibition, and gained the only gold medal thereat for preserved butter. As a further test of its keeping properties, he sent his preserved butter to the Melbourne Exhibition of 1880, and after crossing the tropics on the voyage out, it gained the highest award, the silver medal and first order of merit. He has since gained a silver medal at Calcutta, and his preserved Irish butter is now (1885) on exhibition in the Government section of the World's Exposition at New Orleans.

The reports from very remote parts of the world, where it has been sent, Java, the Straits Settlements, China, India, South America, Africa, and other tropical and trans-tropical countries, are most encouraging, and there is every indication that Irish preserved butter is rapidly gaining favor all over the world.

The following tables will show the fluctuations in the prices of the finest butter for forty years, ending in 1881:

Tables (prepared by the writer) showing the average price of the finest butter each month, year, and ten years, and the rise in prices from the lowest to the highest price each year, for the forty years ending in 1881.

[In shillings per cwt.]

1841 to 1851.

Season.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Average for season.	Rise in price.
1841–'42	111	100	89	89	90	84	89	90	86	89	85	80	90	31
1842–'43	74	90	80	81	75	80	80	78	78	82	86	88	81	16
1843–'44	84	86	73	72	70	69	72	73	73	75	77	74	78	17
1844–'45	86	76	73	71	71	76	81	94	96	94	94	100	84	29
1845–'46	101	90	77	83	83	91	93	94	86	88	91	90	89	24
1846–'47	98	99	74	84	85	93	93	89	92	90	93	102	90	28
1847–'48	105	102	88	85	87	92	91	88	90	94	98	100	93	18
1848–'49	106	94	83	82	81	78	76	75	70	70	70	72	80	36
1849–'50	88	80	65	66	65	68	72	71	73	74	78	78	73	23
1850–'51	88	84	65	66	69	79	81	78	79	80	89	89	80	24
Average ..	94	89	77	78	78	81	83	83	82	84	86	87	84	24

1851 to 1861.

1851–'52	86	80	68	70	73	75	76	80	77	78	80	80	77	18
1852–'53	86	77	69	69	72	78	79	86	90	95	94	94	82	26
1853–'54	104	102	81	90	93	95	96	98	101	107	107	107	98	26
1854–'55	111	101	92	92	96	96	98	98	102	104	105	107	100	19
1855–'56	120	113	100	98	99	101	106	112	112	114	118	122	109	24
1856–'57	140	130	106	105	107	109	114	116	120	121	122	122	118	35
1857–'58	120	114	100	103	108	114	116	110	105	114	118	126	112	26
1858–'59	122	112	99	104	104	105	105	105	108	120	128	126	112	27
1859–'60	120	112	102	103	106	110	115	117	120	121	127	130	115	28
1860–'61	128	122	107	106	105	106	111	114	115	116	112	113	113	23
Average ..	114	106	92	94	96	99	102	103	105	109	111	112	104	25

1861 to 1871.

1861–'62	113	111	95	96	97	102	103	105	110	113	116	116	106	21
1862–'63	127	103	93	93	94	98	100	104	105	115	118	119	103	34
1863–'64	120	101	88	87	93	101	103	111	111	117	117	117	106	33
1864–'65	114	101	94	105	112	118	118	117	132	124	124	124	115	38
1865–'66	127	106	102	110	117	120	130	129	130	134	135	136	123	34
1866–'67	132	116	111	113	114	114	115	112	114	120	120	120	118	21
1867–'68	122	108	100	99	97	102	106	105	107	115	120	121	109	25
1868–'69	128	106	102	109	121	127	130	131	136	145	144	138	126	43
1869–'70	130	105	103	104	111	119	125	128	131	135	133	135	122	29
1870–'71	130	108	111	117	125	130	130	130	138	146	148	150	130	42
Average ..	124	107	100	103	108	113	116	117	121	126	128	128	116	32

1871 to 1881.

1871–'72	147	120	118	117	118	124	129	130	132	135	135	135	128	30
1872–'73	136	116	114	111	115	122	125	124	129	138	139	140	125	29
1873–'74	142	120	115	114	119	129	135	139	145	151	155	156	135	42
1874–'75	154	121	123	129	141	146	140	150	153	155	155	155	144	34
1875–'76	145	119	120	120	119	129	138	140	145	146	150	160	135	41
1876–'77	150	130	124	127	135	149	150	146	154	158	158	150	144	34
1877–'78	142	119	119	117	115	126	123	121	130	132	138	140	126	25
1878–'79	147	115	104	101	109	113	115	119	126	128	128	133	120	46
1879–'80	127	103	87	79	78	105	126	128	139	140	140	147	116	69
1880–'81	148	112	112	115	124	133	139	136	143	143	143	143	133	31
Average ..	144	117	114	113	117	128	133	133	140	143	144	146	131	38

For the five years which have passed of the current decade, prices have been made lower and the tendency seems to be still lower prices.

The present year is the cheapest for a long time back, the butter market feeling the effect of the great depression in prices as severely as other classes of farmers' produce.

For the ten years ending January 1, 1881, a little over 4,000,000 firkins of butter passed through the Cork market, or an average of 400,000 firkins a year, which, if valued at £3 10s. ($17.03) per firkin, would give an annual total of £1,400,000 ($6,813,100) as the yearly value of the butter sold in the Cork butter market during these two years.

T. J. CLANCHY.

THE BUTTER INDUSTRY OF IRELAND.

[Evidence of William J. Lane, esq., before committee of House of Commons.]

To discuss the question of the Irish butter industry from either the farmer's or trader's point of view would be an inexcusable mistake. Its national importance could hardly be overestimated. The manufacture of butter is the staple industry of Ireland, and any close student of what is going on in other countries must recognize that the future agricultural prosperity of Ireland largely depends on the full development of its dairy industries. While British free-trade legislation continues it would be simply impossible for Ireland to compete, as a grain-producing country, with the ever-increasing wheat areas of Canada, United States, Russia, India, Egypt, and Australia.

The approximate number of cattle in the United States is 51,000,000, and the possible increase may be estimated by the fact that the pasturage lands west of the Mississippi exceed 780,000,000 acres. Each year the cattle-raising industry of the United States makes a vast stride, and year by year the development of the American railway-systems and the competition of ocean-carrying lines enables the surplus produce of America to be landed on our shores at prices with which Irish farmers cannot compete.

The threatened competition of Australia and South America in the meat markets of Great Britain, by means of refrigerator transportation, should not be minimized or ignored as another source of danger to the Irish cattle trade. These facts justify the assumption that Irish farmers cannot, in the future, look forward either to the raising of grain or cattle as a remunerative employment. Barley and oats, of course, may yet be regarded as paying crops, but, like all others, they also are menaced in various ways. By climate and the nature of its soil Ireland is specially adapted to the manufacture of butter, and its geographical position certainly gives it great advantages for the speedy marketing of its produce, as compared with the other countries rivaling it in the butter trade of England.

Addressing the Royal Dublin Society in December, 1879, Professor Sheldon valued that year's make of Irish butter at £6,181,818. I have no hesitation in saying that by proper development the butter produce of Ireland could be raised to an annual value of over £12,000,000, with even the same number of cows. This is not difficult to calculate. With the present very inferior breed of dairy cattle in Ireland, the average annual production of milk per cow may be put down at 430 gallons. It requires 3½ gallons of the milk yielded by these cows to produce 1 pound of butter by the ordinary methods of setting and churning. This gives a return of 123 pounds of butter per cow. The cows on the Munster model school farm give an average annual yield of 690 gallons of milk, which, by the use of the separator, produced an average yield of 276 pounds of butter per cow. Mr. Richard Barter, of St. Anne's, Blarney, attains an average of 228 pounds of butter per cow in his improved dairy. Taking a far lower standard than Mr. Barter's of what might be achieved by an improved breed of dairy cows, and an improved method of manufacture, I do not think a yield of 205 pounds of butter per cow would be an impossible achievement, which would be an increase of two-thirds on the quantity made at present. To estimate the increased price which would be otained for Irish butter manufactured on the most improved continental systems at one-third of its present value needs no figures to support the assumption. Should the accuracy of the above figures be questioned, which is quite possible, because there are no standard records of the produce of the average dairy cow of the Irish farmer, I can fall back on the wide room there is to support a vastly-increased number of dairy cows in Ireland, to sustain my theory that the butter produce of the country can be raised to an annual value of £12,000,000. This sum would pay two-thirds of the present rental of Ireland, and if the dairy resources of Ireland were developed to their full capacity, the whole present rental should be paid by the butter produce alone. This shows the great national importance of the Irish butter industry, and it is as a great national question it should be discussed.

It would be very difficult to convey to the minds of persons outside the Irish butter trade the very low level to which Irish butter has fallen in the markets of Great Britain. Perhaps its position could not be better illustrated than by stating that in Dublin, the capital of Ireland, the requirements of the consuming public are almost entirely catered for with Danish butter and Dutch butterine. One line of steamers from Rotterdam has brought no less than fourteen thousand packages of butterine to Dublin since the 1st of January, and very large quantities manufactured in other countries have been brought by other routes, the exact amount of which could not be ascertained. When this is possible at a time when the produce of Irish dairies was being sold at 5*s.* 6*d.* per pound, and the best at 9*d.*, no surprise need be expressed at the exclusion of Irish butter from London, Manchester, Liverpool, &c. As a matter of fact Irish butter can only be sold now with very great difficulty in a few of the manufacturing districts of England, and the area of its consumption is becoming more limited every year. Its competition now is rather with the produce of the butterine factories than with the butter shipped from France, Denmark, Germany, and Sweden. Butterine has realized a higher price in the English and Dublin markets for the past twelve months than secondary grades of Irish butter, and the bulk of Irish butter, unfortunately, is of secondary quality. The price realized for Irish butter is simply ruinous for the Irish farmers, and with a continuance of the existing system of Irish dairying, the prospect is most disheartening. It simply means agricultural ruin, and agricultural ruin means national bankruptcy for Ireland. I have measured and do not shirk the responsibility of this statement. The sooner it is recognized by every one interested in the welfare of this country the better.

That there is no natural impediment to Irish butter excelling the produce of all other countries is clearly established by Mr. T. J. Clanchy, of Cork, having obtained the gold medal at the Paris Exhibition of 1878, and medals at the exhibitions of Calcutta and Melbourne, from all competitors, with the butter of selected Irish dairies, and, also, by the extreme high prices commanded on the London market for the butter of one or two factories established in Ireland, on the continental system, by the Rev. Canon Bagot. What, then, it will be asked, has caused the decline of the Irish butter trade? I do not hesitate to place the responsibility for it on the neglect of our Government to provide for the education of our farmers, as has been done by the Governments of all those countries which have excelled us in the manufacture of butter for the last thirty years. With paternal solicitude they spared no efforts to bring education on dairy-farming within the reach of their agricultural populations. The success of their efforts is evidenced by the prosperity of their dairy industries, as also by the sad plight of the Irish dairy farmer, who has been left unassisted and uneducated in the keen competition forced on him by his European and American rivals.

The ruin which is now impending over the dairy farmers of Ireland, and the general agricultural depression of this country, is rebuke sufficient for the apathy and neglect the Government that undertakes to rule us have exhibited towards Ireland's best interests. The Governments of the United States, France, Germany, Denmark, and Sweden have all recognized their responsibility of practically educating their agricultural subjects, and have spared neither money nor trouble in efficiently discharging that duty. The Government of Ireland has done nothing for the Irish farmers. The farmers of Ireland had a far stronger claim on the Government than those of any of the countries above named. Because, owing to past British legislation, they were denied education, and, owing to the Irish land-laws, they have been always kept on the border of poverty. They were thus prevented from doing for themselves what was done for the educated and prosperous farmers of other countries by their respective Governments. I do not want to introduce politics, unnecessarily, into this statement, but it is impossible to exclude the attitude of the Government of Ireland from the discussion of a question which so very largely hinges on the measures that have been adopted by the Governments of those countries which have so successfully driven Irish butter out of the markets of Great Britain. Without the assistance and education given by the continental Governments their dairy farmers could never have beaten Irish butter out of the markets. Up to the time these Governments made dairy interests a state care, Irish butter, through force of the superiority it derived from the natural advantage of soil and climate, was highly prized not alone in England but in every country penetrated by British commerce. Year by year, as education improved the make of butter in other countries, the prestige of Irish sank lower and lower until it has come to that point beyond which it cannot go without extinction.

Situated, then, as they are, through no fault of their own, the Irish dairy farmers are utterly unable to help themselves in this uneven struggle with the state-supported competition of other countries. Their ignorance of even what is causing the depreciation of their produce (as is evidenced by the complaints in the Irish press against the Irish butter merchants), and their utter inability through want of capital to provide either an improved breed of dairy stock or the proper appliances for modern dairying, make an unassisted effort to maintain the struggle for existence a simple waste of energy. In other countries the resident nobility and gentry largely aid the schemes of Government education by maintaining large model dairies on their estate, where Government teachers instruct the tenantry, by practical dairy experiments, and by the sale of calves off these farms, the breed of the best dairy stock is disseminated amongst the smaller dairymen. By having the center of attraction in London, Irish noblemen and large landed proprietors live out of the country, and even this supplemental assistance and education which is given on large estates on the Continent is denied to the Irish farmer. Besides the large endowments given by every State in the Union for agricultural colleges, the American Government spent $475,719.26 last year in circulating knowledge in agricultural matters amongst the wealthy farmers of the United States.

What has been done, and is being done by European states to promote scientific dairy-farming has been so often placed before the public of late that I need not recapitulate it here. A reference to the United States consular reports will reward the inquisitive on the point. I have said enough to prove that it is the paramount duty of the state Government to come to the assistance of the Irish dairy farmers, and to do so quickly if they are to be saved from annihilation, and Ireland from overwhelming disaster, the Government must fully recognize that they alone, by neglecting their obvious duty, are responsible for the existing crisis, and half measures of assistance, or feeble experiments will be of no avail. I am not concerned with the general agricultural requirements of Ireland, and must therefore only confine myself to such parts of a general agricultural improvement scheme as I think imperatively necessary for the proper development of the manufacture of Irish butter. In the United States the Department of Agriculture at Washington looks after the interests of agriculture over their whole territory; it is presided over by a minister, assisted by a scientific staff. Each separate State, there, has its own agricultural colleges and farms.

I do not think we need go farther for a model of what is wanted in Ireland. We want a department of agriculture in Dublin, whose duty (*inter alia*) should be to direct a system of dairy schools and farms in every county to train teachers for those schools; to collect and disseminate information on every subject connected with the most improved systems in other countries; to import and experiment on the best breed of dairy cattle, and distribute them on the state dairy farms of the counties for which each breed was best adapted, to provide Government loans to farmers for the erection of dairy and cow houses, and in every other way to promote the general dairy industry of the whole country. There should be a Government dairy college in every county, and, to fulfill its mission properly, a farm of dimensions proportionate to the number of pupils, who, from the agricultural population, might be expected to attend, should be attached to each. The scale of fees charged should be within the reach of small farmers, and scholarships ought to be awarded at an entrance examination, to induce intending pupils to study elementary subjects connected with dairying. In some of the large agricultural colleges on the Continent, the Government contributes a grant for each dairy maid equivalent to the difference between the value of her work and her expense on the establishment; she pays nothing for her education. In the Swedish colleges the cost of maintaining a dairy maid for a year is £18, her work is valued at £7, and the Government contributes £11. The produce of the dairy leaves the establishment a profit. In such colleges the agricultural male pupils pay high fees. On these Irish county farms a herd of pedigree bulls and cows should be maintained, the former should be available to the farmers of the district on payment of a fee, and the latter (of different breeds) should be experimented with to test their milk and butter producing capacities on the different kinds of pasturage in each county.

The importance attached to this point on the Continent may be gathered from the fact that there are different staffs of Government professors employed for eight or ten years consecutively examining with the most accurate scientific precision (even by analysis of the skimmed milk and buttermilk) the produce of all the various breeds of dairy stock on every different section, so as to decide by what artificial foods the pasture grazing should be supplemented on each farm to maintain a maximum butter produce. The same scientific precision informs the farmer of each district at what temperature the dairy-house, the cow-house, the cellar, and even the drink of the cattle must be maintained for every week of the year; in the same way he is guided as to comparative advantages of the dry tub, water, ice, and separator system of obtaining his cream, and even to the effect which the difference between 2,400 and 2,500 revolutions per minute of the separator will cause on the quality of the cream, I digressed to show by what means the perfection of dairy farming has been accomplished on the Continent.

The total absence of what may be called any high-milking stock in Ireland is one of the gravest features of the situation. Even amongst those who go in for keeping very high-class cattle in Ireland, the greatest attention has been paid to the strains that produce most beef, at the expense of the loss of the milk. In other countries they breed dairy stock for milk first and beef afterwards. They consider it pays them better to get a high return of butter for some years and lose a little on the sale of the cow. In a very few years a small herd of a good strain of milkers on each Government farm would disseminate good milking blood through the whole dairy stock of Ireland. At present, the general run of farmers never know what kind of stock their dairy cows are derived from; they buy them on chance, in fairs and markets. Some idea of what may be done in the way of breeding for milk may be gathered from the fact that in America particular strains of Jersey cows yield from 90 to 100 pounds of butter per month, and there are authenticated records of cows yielding 105 pounds of butter per month for a season. Of course these cattle are only fancy breeds, but it shows what might be done on Government farms. The particulars of these records can be found in the Breeders' Gazette of America. It is unnecessary for me here to state what should be the training given in such dairy schools to pupils. There should be a seed-testing station attached to each, as one of the greatest drawbacks to small dairy farmers in Ireland is the wretched class of seeds imposed on him by unscrupulous dealers. I am informed by practical farmers of great experience that it is owing to the deleterious adulterations of grass seeds that the increased aborting of cows is mainly due. This source of loss to the Irish dairy farmer is increasing year after year. It is being anxiously investigated by the American Government, and different authorities ascribe its spread to different causes. It illustrates the necessity of having a veterinary as well as a seed department in each school. Each of these county establishments should be provided with a traveling dairy, and its working, illustrated by a competent lecturer, should be exhibited at the large fairs and other centers where the agricultural community could be instructed. A model dairy and permanent exhibition of improved appliances might with very great advantages be established at the Cork Butter Market, where hundreds of farmers could see it in operation every day. Dairy education must be brought within reach of the farming masses, poor as well as rich. I think elementary education on dairy farming should form part of the national school system. Government should supplement the funds of agricultural societies to enable them to offer attractive prizes for successful dairying. Without proper dairy and cow house accommodation no amount of education would enable the Irish farmer to produce good butter. They are practically without one or the other at present, that is, as these buildings are understood in dairy countries, on the Continent and in America. Milk, cream and butter are most susceptible of taint from any kind of bad odors or impure air. The most frequent complaint against secondary Irish butter is its peaty or smoky flavor. This is contracted by having the milk set, and the butter made in the ordinary dwelling rooms of small farmers. Impurities also attach to the milk, owing to the filthy condition of the cow from bad stabling. Therefore a model well-drained cow-house is of as much importance as a model dairy. Loans on favorable terms should be given to the farmers to erect those buildings, and I think it would be well if the Government prepared model plans for each class of building, and insisted on their being all constructed according to those plans. The cost could be fixed by scale, in proportion to the number of cows to be provided for. The expense of obtaining such loans should also be regulated by a low fixed scale. In asking so much assistance from the Government for Irish dairy farmers, I do not ask for more for them than has been done by other Governments, and I do not see why these county farms should not be, at least, self-supporting. No scheme of improved dairying will quite enable the Irish farmer to compete favorably without extension of the present means of transportation. Ireland must be opened up by either tramways or light railways, and until some cheaper and quicker means of being able to construct them than exists at present is provided by legislation, limiting and reducing the power of factious opposition, this development will be of very slow growth. If the Government recognize the strong claim the Irish dairy farmers have on them, and even at the eleventh hour undertake to provide the assistance I ask for, then there is still ample room to hope for a speedy revival of the Irish butter trade and the prosperity of the country. With proper manufacture Irish butter must lead the market, on account of its natural superiority and flavor. Of course a great deal will have to be done by all who have to handle the improved make of butter, so as to put it in the markets in the most attractive shape. The packages must be greatly improved—I would recommend white packages, of 56 pounds, as most likely to be received favorably. They should be so shaped that they could not be rolled; this would save the butter from great abuse, and keep the packages clean. I see no reason why our butter packages should not be made of beech, which grows in Ireland most abundantly, and, which, consequently, would cost less than imported oak.

There is an objection to it on the ground that butter does not keep so well in beech as in oak casks for a lengthened period. In the future there will be no necessity to keep butter any time in casks, and prejudices of this kind should not be permitted to interfere with the utilization of this native timber, which is now practically worthless when grown in quantity. The most scientific butter-producing countries, Denmark, Sweden, Germany, and America, use nothing but beech packages, while we in Ireland, through our ignorance, send from £50,000 to £100,000, annually, out of the country for imported oak. In this connection, I cannot omit referring to the very bad treatment which Irish butter receives from both our railway and steamship companies. They handle it roughly, which, of course, injures the quality, and neither on their platforms, wharfs, trucks, or steamers, do they make any special provision, in the simple matter of cleanliness, for the proper transportation of Irish butter. The consequence is that very often a shipper is not able to recognize in the begrimed casks delivered in London or Manchester the clean packages shipped at Cork or Waterford. In this matter a great injustice is done to Irish butter. In the local rates from producer to market, and in the general rates from Irish markets to the English centers, Irish butter is very heavily handicapped by excessive charges. Butterine is brought from Holland to Dublin at less money than Cork butter could be delivered in Dublin. Butter is brought from New York to Liverpool at less money than from Cork to the same port. It costs 42*s.* 6*d.* per ton to send Cork butter via Dublin to Bradford, and Danish butter is brought from Copenhagen via Hull, Bradford, and Liverpool to Dublin at 25*s.* per ton. The Irish carrying companies are doing their best to kill the Irish butter trade. I wish a deputation of their traffic managers would visit France and Holland to see the delicate handling which butter receives from the carrying companies there, and the scrupulous cleanliness of the trucks and steamers specially reserved for butter traffic. What is wanted in Irish butter is cleanliness in make, packing, and transportation, close grain, and fine texture, total exclusion of water, freedom from oversalting, even quality, even color, and uniformity of weight. I cannot conclude this paper without referring to the butterine trade. It would be childish to say that because butterine interferes with the sale of butter therefore it ought be suppressed. When manufactured from wholesome ingredients and sold under its proper designation it is as legitimate an article of food as any other. But when the trade is conducted as it now is, most dishonestly, it ceases to have any claim to considerate treatment. In this week's issue of The Grocer, one of the largest wholesale houses in London advertises to sell it as finest Irish firkins and fine Irish firkins; a Dutch firm offers, by circular, to make it so as to imitate any well-known butter—Irish firkins and Irish roll being specially mentioned. Every week's police office reports contain records of fines imposed for selling butterine as butter. In Dublin last week several firms were fined £10 for selling Dutch butterine as Irish roll butter. I have no hesitation in saying that I believe nineteen-twentieths of the butterine sold in Great Britain is consumed as butter. Irreparable damage has been done to the dairy interests of these countries by this nefarious trading, and Parliament should intervene to put a stop to it. This compound has no claim to the name butterine; it is adopted to deceive the public. This name should be prohibited. Let these compounds of fat be called margarine or oleomargarine. If, as they claim, the manufacturers depend on its intrinsic merits to sell it, they need not fear adopting its true designation. Every package imported into the country should have either of those names branded on it in letters one inch long, and also the name or the manufacturer or his trade-mark. Every package issuing from a British factory should comply with the same conditions. Every shopkeeper selling any quantity of these compounds should be bound by law to mention the name of the compound to the purchaser. If these conditions be enforced, with the same penalties as they (or simillar provisions) are enforced in other countries, no injustice will be done to honest traders, and a great act of justice will be done to dairy farmers, who have quite enough to face in the keen competition of honest rivalry. The existing powers of dealing with this gigantic swindling are utterly inadequate. Unless from those who are interested in maintaining fraud, I don't see where any opposition could be given to legislation in this direction.

FRANCE.

CATTLE BREEDS OF FRANCE AND THEIR PRODUCTS.

REPORT BY CONSUL WILLIAMS, OF ROUEN.

INTRODUCTORY.

In compliance with the request of the Department of State to examine and report upon the subject mentioned in the cattle circular addressed to the consuls of the United States I have categorically answered the questions therein propounded (see statement at close of report) and will attempt to render the work more complete and practical by such descriptions, illustrations, and information as I have been able to obtain from personal observation of the different breeds of cattle in their original homes and from other reliable sources.

This consulate embraces a large portion of the ancient district of Normandy, is situated in the northwest portion of France, and well adapted by its fertility and abundant supply of water for grazing purposes, and has long been distinguished for the peculiar and marked type of its cattle and horses, and affords a wide field for the study of the races of cattle indigenous to France; while its contiguity to Great Britain on the one side, and Belgium, Holland, and Germany on the other, renders great caution necessary to discriminate between the original and mixed breeds. We reserve the title of distinct breed to a number of individual animals presenting uniform characteristics, shapes, and adaptabilities, and capable of transmitting and perpetuating this type in their progeny. There must be this fixity to constitute a race.

DISTINCT FRENCH BREEDS OF CATTLE.

France appears to have a substantial claim to eighteen distinct breeds of cattle, of which I append a list, adopting the French nomenclature:

(1) Flamande, (2) Normande, (3) Bretonne, (4) Parthenaise, (5) Charolaise, (6) Limousine, (7) Mancelle, (8) Comtoise, (9) Femeline, (10) Bressane, (11) de Salers, (12) Garonnaise, (13) Bazadaise, (14) Landaise, (15) Gasconne, (16) Barétone, (17) Béarnaise, (18) d'Algérie.

Although many other varieties of cattle are found in France than those enumerated above, I cannot view them otherwise than as traceable to the foregoing parent stock, or the issue of imported animals, which will receive passing notice in considering the cattle of France.

The description of a breed is not easy to outline, but I will endeavor to sketch the chief characteristics of a group of which the individual specimens present various traits.

FLEMISH CATTLE.

Origin.—The origin of this breed is not precisely known. It is probable that this race originated on the shores of the North Sea, whence came the breeds of Holland, Schleswig, Holstein, and Jutland, all remarkable for their milking qualities. The center of production and rearing of the best specimens of the breed "Flamande" is in the departments of the north of France, in the rich pastures of Bergues, Dunkirk, Cassel, Bailleul, Hazebrouck, and Lille.

We meet with less numerous herds, more or less distinct and pure, in Boulonnais (termed Boulonnaise), in Artois (Artesienne), in the departments of the Somme, Oise, and Aisne (there termed "Picarde"), upon the borders of the Sambre (Maroillaise), and about Bordeaux Bordelaise). The Bretonne breed has contributed its share to the production of the latter variety of this race.

In its original home there are two varieties of this breed, that of the region of Bergues and that of Cassel.

The variety of Bergues, or Berguenarde, has slightly greater length of horns, is thicker set, and is adapted to fattening and yielding milk. It is carefully maintained for both purposes. The animals reared about Cassel are finer and more sought for, being preferable to those of Bergues for dairy purposes.

Description.—The Flamande breed is essentially valuable for the dairy, and incidentally only for food, and is not adapted to work, and is destined to predominate in the dairies of the northeast of France. I will therefore more particularly describe some of the peculiar features of the cow of this breed.

The head of a good cow is fine, of conical form, rather long; the nape of the neck thinly covered with hair; the horns wide apart, fine throughout, projecting forward and downward, and in such a manner that in some animals they bend back and touch the forehead; they are small, white or yellow, with black tips; the ear is blunt, moderately large, and covered with fine hair; the eyes projecting and black, with a mild expression; the forehead long, and ordinarily narrow, terminates in a snout slightly protruding, of black or mixed color; the neck long and thin; the brisket is prominent and well hung; the withers, well developed in the best types of Bergues, are small in ordinary specimens; the line of the back is straight, with a slight depression at the junction of the back with the loins, due to the separation of the vertebra—greater strength of spine and loins would be desirable; the hips, often protruding, measure between one another from 24 to 26 inches; the uttocks are equally prominent and wide apart; the base of the tail is w, sometimes a little raised by the protrusion of the sacrum, of which the line is not sufficiently grounded with that of the coccygeal bones; the tail is fine and long, terminating in a thin tuft of hair; the chest is narrow and confined, and the ribs rather flat (the cattle raised in Bergues and Cassel have a tendency to lose these defects); the belly is of moderate size, but ample towards the flanks and mammary region, of which the loins are well developed and occasionally forked; the bag large, round, often of a brown or spotted color, and well hung; the teats are of moderate size, covered with fine skin and soft hair; the shoulders rather flat and moderately muscular; the hoofs black; legs flat and the buttocks sometimes depressed; the coat reddish brown, ordinarily of deeper tint towards the head, and sometimes there appears on the flanks, on the head, and especially on the cheek, white or speckled spots, and these are considered signs of pure blood. Many of this breed are found in Flanders of bright-red color or deep brown, others roan, but the reddish brown is considered the type of the race.

The traits sought for by the breeders of this race in the cow are those which would indicate an aptitude for milking, without an inclination for fattening; a certain harmony of form, a little gaunt rather than too much rounded; a bony, well developed frame, giving size to the body; the hind quarters relatively more developed than the fore quarters; the flanks large and deep, joined to a good-sized and well-hung bag, terminating in regular teats, with skin supple and soft, rather than too fine; a head with little flesh; a lively and at the same time soft expression of the eye; in short, all of the well-known characteristics which present a feminine aspect to the eye of an expert.

Milking qualities.—There are Flamand cows yielding 35 to 40 quarts of milk per day. This yield is quite exceptional; is only attained at the expense of the richness of the milk, or to the great injury of the race itself. In the Flamand country the average yield of a good cow is about 2,640 quarts per year, or 10 quarts a day during the season of pasturage for two hundred and ten days, and 6 quarts per day during the season of winter, and remaining dry for two months.

Weight.—The weight of such a cow is about 1,000 to 1,200 pounds; size at the withers, 53 inches; at the croup, 55 inches; the length from the nape of the neck to the withers is 5 feet 3 inches; from the withers to the level of the joint of the buttocks, 4 feet 9 inches; the head, 9.7 inches; the circumference of the body behind the shoulders, 6 feet 3 inches; the size of the haunches, 2 feet 3 inches, and the height about 2 feet 6 inches from the ground.

Flamande bull.—The best breeders select the bulls of this breed from those contrasting with the cows and supplying the deficiencies of the cow, but with a feminine appearance, not disregarding the signs of a vigorous constitution. Thus, the preference is given to bulls with a low-hung body; tail, loins, and thighs muscular. Experience has demonstrated the success of this method of improving the species.

It will be noted that in this description of a race reared for its lacteal qualities are certainly found many features which would commend it to the butcher, and this view is corroborated by the fact that these animals are highly prized by the consumer. A glance at the bull of this breed corroborates this fact and indicates clearly the adaptability of the race for fattening purposes. The color of the coat is of a deeper tint than that of the female; the head sizable; snout fine, neck moderately full; throat and dorsal muscles sufficiently supplied; shoulders rather small; the body raised and slightly pointed; defects which yield to good treatment.

The weight and measurement of a bull of this race aged thirty months, raised in the department of the north, I herewith subjoin with cut.

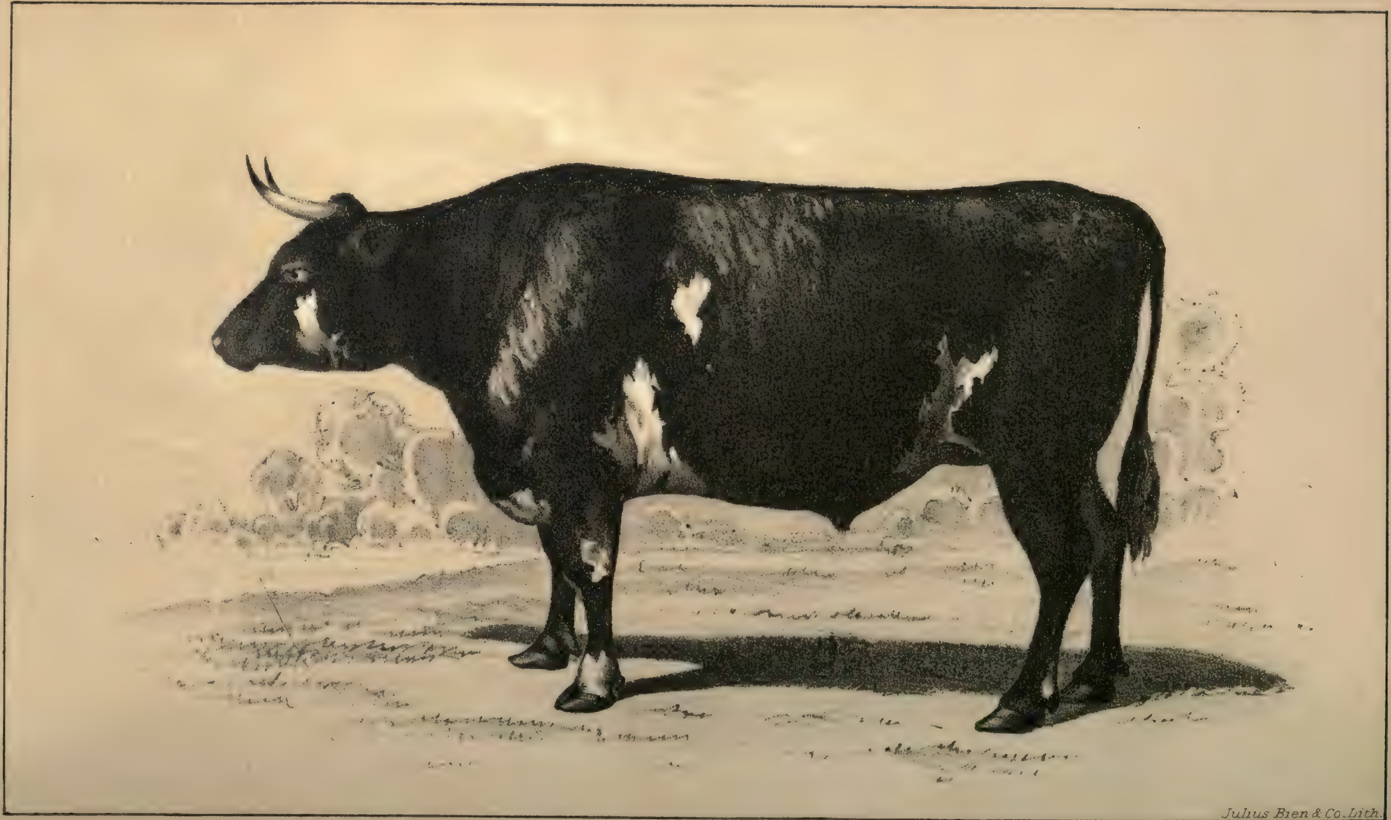
The Flamand ox is exceptional, the females being universally raised; the few oxen are raised with a view of exhibiting at the agricultural fairs.

The Flamand ox has been utilized at the beet-root sugar manufactories of the north, and if not subjected to severe labor, they fatten readily on the refuse of these factories.

BREEDS OF SUB-FLAMANDS.

In traveling on one side from Dunkirk to Boulogne, Montreuil, and Abbeville, and on the other toward Arras, by the way of Saint Omer, we find modifications in the race Flamande. In the former place the name of "Boulonnaise" is given to the subrace and that of "Artésienne" to that in the ancient province of Artois, although these two subraces are frequently confounded with the mother race. The subrace "Boulonnaise" is of smaller size and less weight, its shape more slender and angular, while the belly and flanks are more fully developed, the

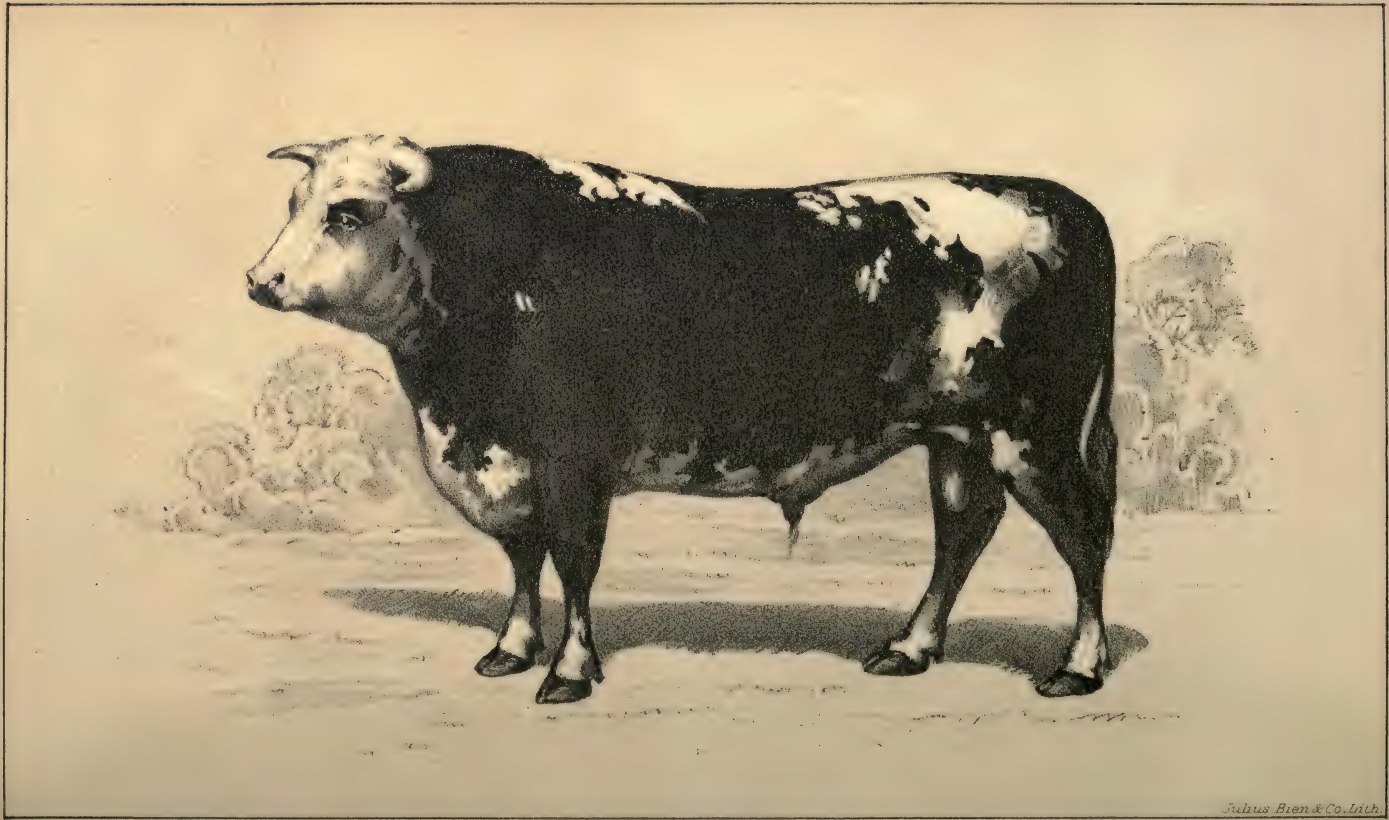
PLATE 83



Julius Bien & Co. Lith.

NORMANDY OX

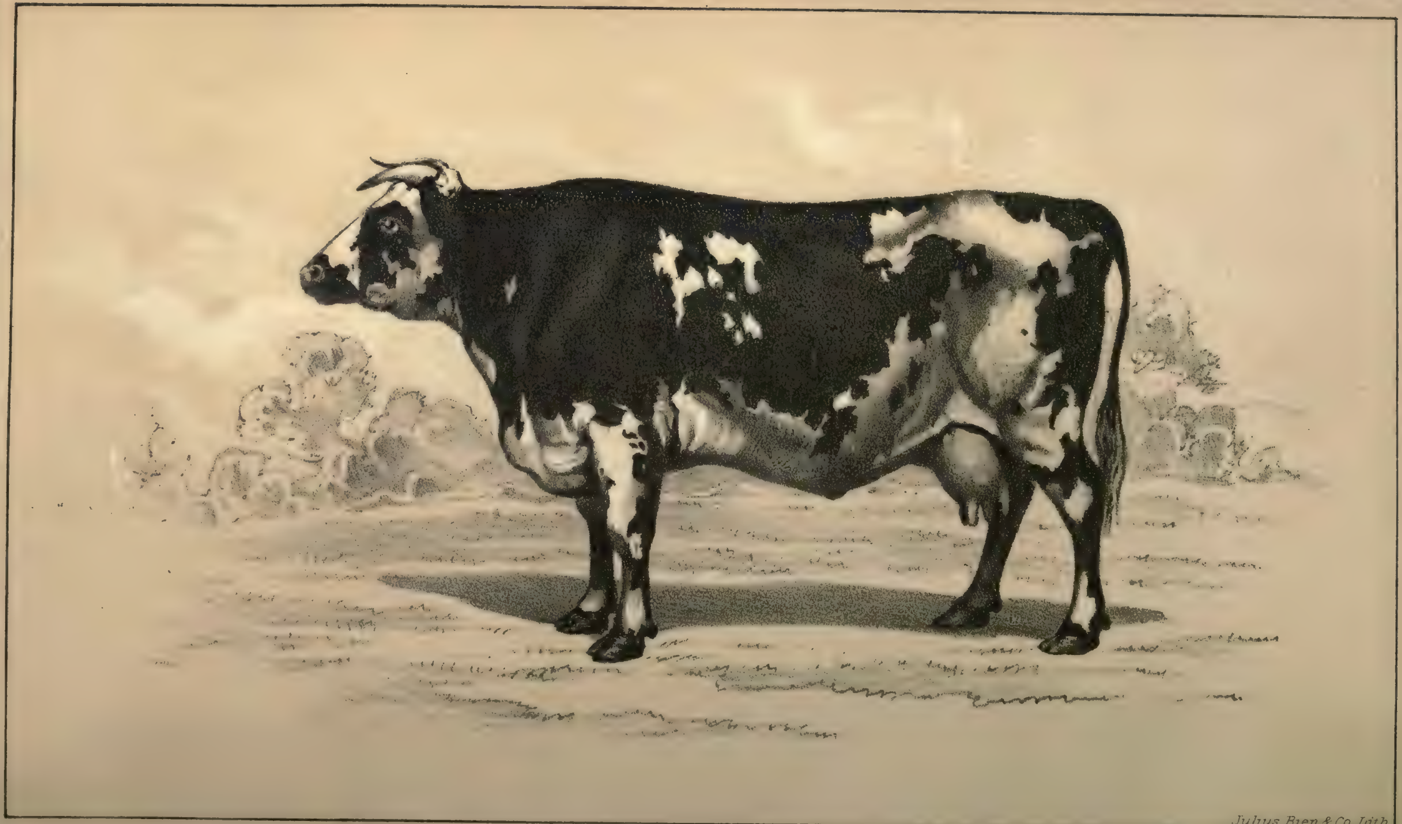
PLATE 82



Julius Bien & Co. Lith.

NORMANDY BULL

PLATE 81



Julius Bien & Co. Lith.

NORMANDY COW

croup and loins large and lean, the udder large, indicating good milking, the hair equally red or reddish brown, and the body nearer the ground. The quality of the pasturage and the care have great effect upon the shape and size of the different species.

The cattle buyers give the name of "Bournaisienne" to the "Boulonnaise" raised about Desvres, Samer, Hucqueliers, and Fruges, small districts formerly known under the name of "Bournais." Under this head is found the "Namponnoise," the variety "Boulonnaise" of the arrondissement of Montreuil as well as of the valley of Authie, derived from Nanpont, a village situated at some distance from the mouth of this river. Toward Boulogne, Marquise, and Calais, the race is larger and becomes identified with the pure Flamand.

The subrace Artésienne, more generally wholly confined to pasturage, which often becomes scanty, is less developed than the cows of Bergues, and even of Saint Omer, is more slender and smaller, but its constitution is less lymphatic. The breeder of these excellent cattle is reluctant to cross them with any other, and fears to impair their milking qualities, which have not been improved by crossing with the Durham, and their adaptation to fattening is unnecessary to develop. It is said that heifers of this breed occasionally become so fat as to remain sterile.

This race includes about one million or more, which number is increasing, constituting about one-twelfth of the entire cattle of France, and of this number four-fifths are found in the eight departments of France, beginning at the north and comprising the adjoining districts. The price of these cattle range from $130 to $175, according to age, weight, &c.; some animals bring $200, and even more. Bulls of this breed are in constant demand from Holland and Belgium.

THE NORMANDY BREED.

The origin of the Norman breed seems unknown, in fact has never been traced. It is considered that the nature of the soil has produced the breed. It seems to have changed very little in the last century and is very remarkable. The center of production of this fine breed is comprised in the departments of Eure, Manche, Calvados, and Orne.

DISTINCTIVE CHARACTERISTICS OF THE NORMANDY BREED.

The distinctive character of this breed is an unprepossessing bony frame, long and heavy head, large snout, a large mouth, such as is found in animals of large appetite; sleek horns, often short and twisted forward towards the forehead; body long, backbone presenting bony protuberances and depressions in the cows advanced in age; neck relatively strong; shoulders muscular; breast rather deep, often contracted; belly large; flank large and hollow; hips ordinarily slightly spread by corpulence; croup small; rump slightly developed; hind part narrow, but with well-developed and well-formed bag, and ordinarily the signs of good milking; limbs short; skin thick and hard, showing signs of slow growth; coat variable as to color, brown, roan, and red, or piebald; never fails to present brown streaks scattered over the surface of the body. This has given rise to the term "brindled."

VARIETIES OF THE NORMANDY BREED.

This breed has varieties more or less distinct. In Contentin and Bessin, which extends from Cherbourg and Lisieux, comprising Valognes, Carentan, and Isigny, a country which is celebrated for its butter, the race takes the name of "Cotentine," and is remarkable for its lacteal qualities. It is called the "race Augeronne" when it is found in the valleys of Auge, whence the large cattle for the Paris market are largely supplied. They give the name of "Augeron," however, to all domestic animals of that region. They say "Augeron horses," "Augeron hogs and sheep." I have been thus particular to explain, as buyers might be unnecessarily confused.

THE MILKING QUALITIES OF THE NORMANDY BREED.

The claim is made for this breed, and especially those denominated "Cotentine," that they were the first milking race in the world. However this may be, it is incontestable that they possess admirable milking qualities. We meet with cows all over Normandy which give 35 quarts in twenty-four hours, and they have been known to produce 50 quarts. The average yield of milk is about 3,000 quarts per year, or about the same as that for the Flamand race. Unfortunately it is a fact well recognized by dairymen that the production of milk is an inverse proportion to its richness or capability of furnishing butter, and it has been stated that 32 quarts of milk from a cow of the Normandy breed produced but 2⅕ pounds of butter (1 kilogram), while it is calculated that from 25 to 27 quarts of milk would suffice ordinarily to make the same amount of butter. The English allow 9 quarts, if the cream and milk are beaten together, for a pound, and 13 quarts if the cream alone is churned.

But only a limited confidence can be placed in the above figures, as the richness of the milk varies not only according to the nature of the cow, but also is greatly influenced by numerous circumstances, such as the food, the gestation more or less advanced, &c. It is admitted by scientists that the cows which furnish the most milk do not give the most butter; but, as far as I am able to inform myself, the variety Cotentine, of the Norman breed, is an exception to this rule, and produces an abundance of milk, and this milk yields relatively a quantity of unexceptionable milk.

ISIGNY BUTTER.

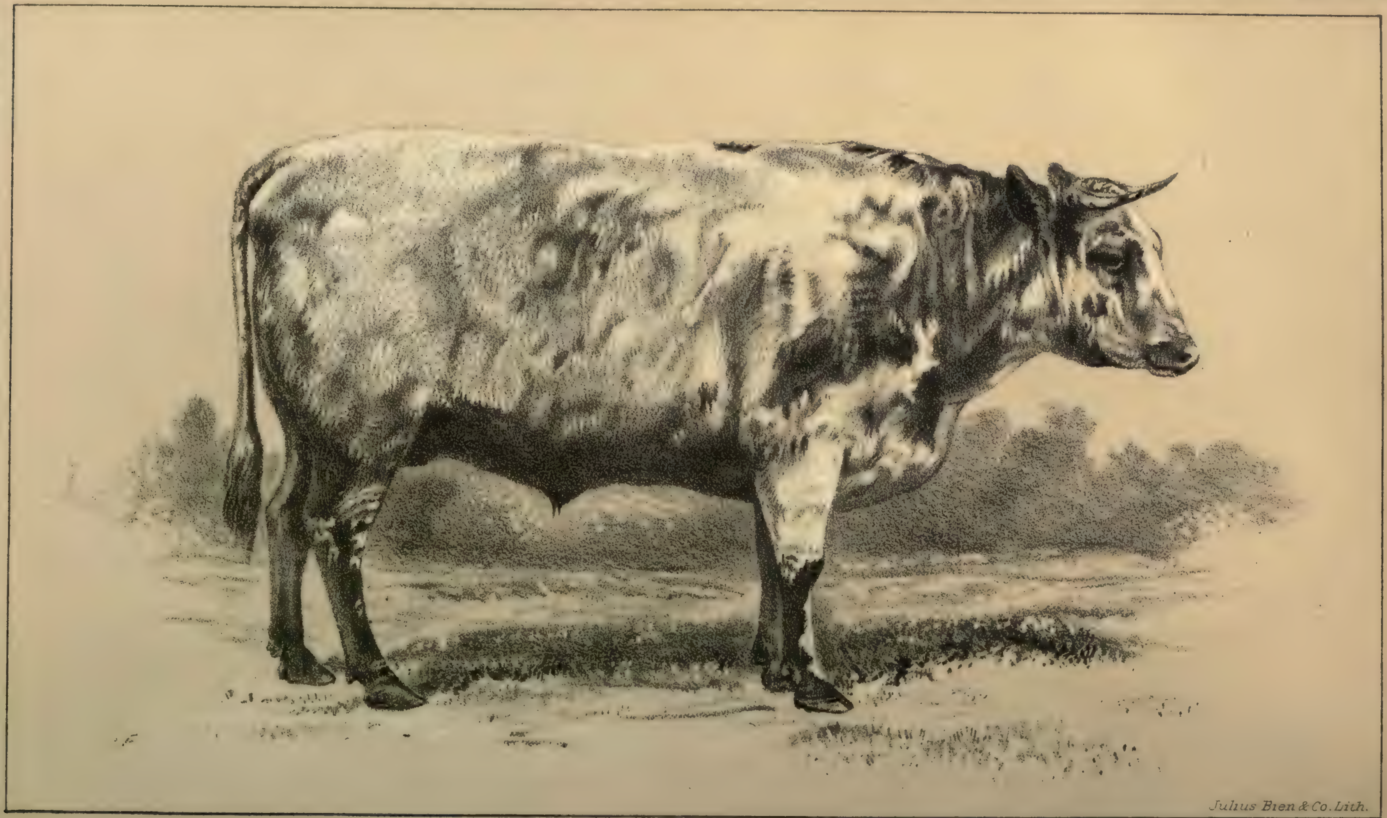
The butter of Isigny is undeniably as good as the world produces. Seven and a half millions of pounds of butter of Isigny is annually consumed at Paris. If a calculation was based on 35 or even 27 quarts per kilogram (2½ pounds), the production of milk would be fabulous for so small a district. However, this is not a sure test, as all the butter called "Isigny" is not made there. The conclusion that the butter of Isigny is better than any other in the world is an affair of patriotism, for we find the "Flamande" lauded in the same manner; the Hollanders say the same of the race Hollandaise, the Swiss of their admirable races Switz, Fribourgoise, and Bernoise.

The reputation is, however, merited in this case, and proceeds from three distinct causes—the stock, the excellent grass, and skill and care in making the butter.

The Normand cow is found all over France, and often furnishes only fair butter elsewhere.

THE NORMANDY AS MEAT CATTLE.

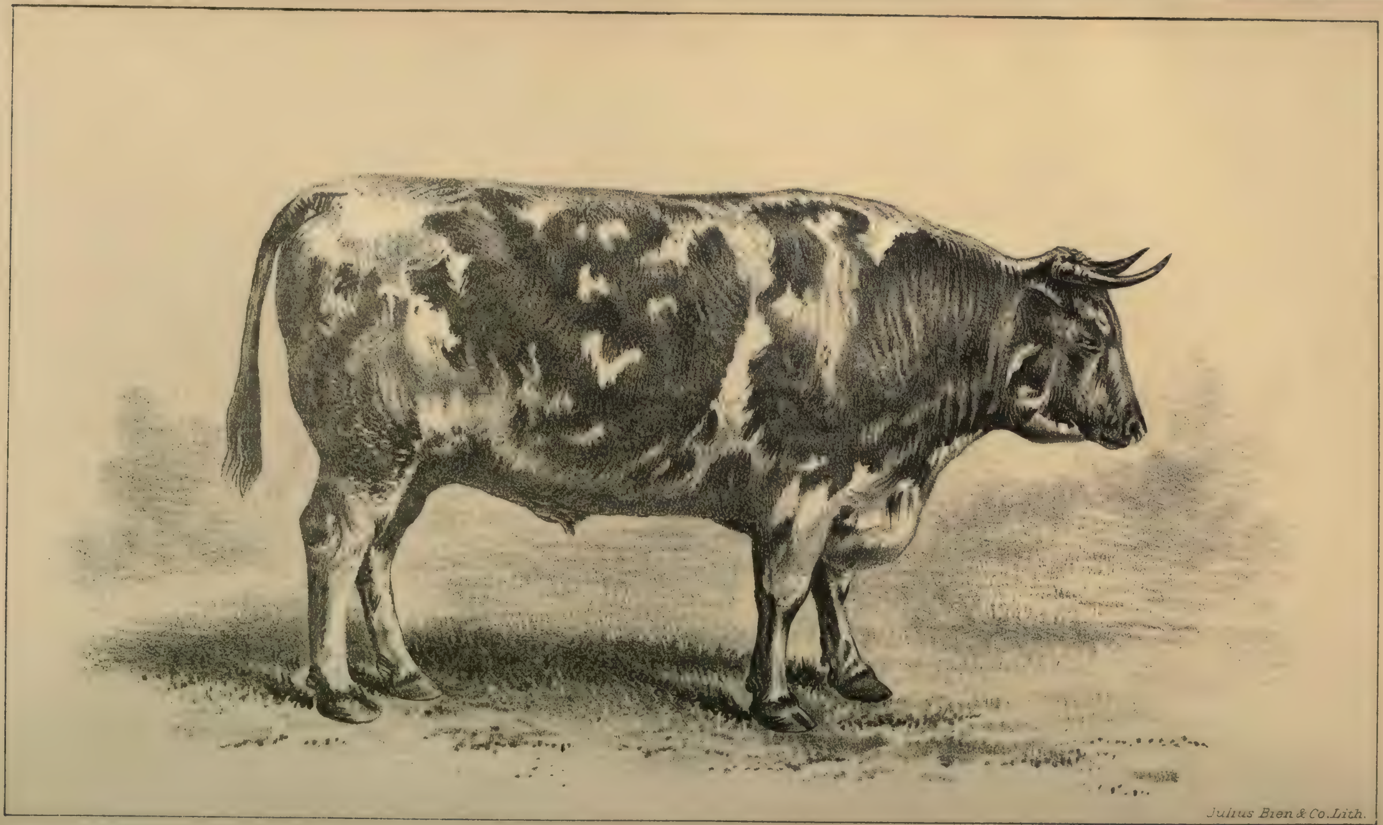
The race Normande furnishes many of the largest animals for the Paris market, notably an ox of six years weighing 1,970 kilograms (4,335 pounds), but it only returned 2,197½ pounds of net meat and 125



Julius Bien & Co. Lith.

DURHAM-SCHWITZ-COTENTINE PRIZE OX.

PLATE 85



Julius Bien & Co. Lith.

DURHAM-SCHWITZ-NORMANDE PRIZE OX.

kilograms (275 pounds) of fat. Another of these monstrous animals weighed 4,185 pounds, and measured $2^{m}\ 45^{cm}$, or 8 feet, at the withers, and $2^{m}\ 97^{cm}$, or 9 feet 9 inches, from the head to the base of the tail.

Their comparative aptitude for work is very slight, a small pair of Gascon, Baudois, or de Salers oxen would soon tire out these huge Cotentines.

The meat of this breed is highly esteemed in regard to quality, but the small proportion of net weight of meat and the great proportion of bone (of make weight) is quite striking. Many attempts have been made to overcome this difficulty without interfering with the extraordinary milking qualities of the breed, but with very indifferent success, and the breeders rest content with the oxen which they have, knowing that in the best dairy races the ox is secondary.

THE DURHAM-SCHWITZ-NORMAND.

There seems no good reason why the cross of the type de Schwitz, which has been frequently tried, should improve the breed. In the opinion of Norman breeders the race Cotentine is the best for milk to be found in Europe, the race Sewitz could not improve it in that respect, and it is not wonderful in its product of meat.

This half-breed has been again crossed with the Durham, and given rise to a new race, termed the "Durham-Schwitz-Normand."

Many rather remarkable specimens of this type have been exhibited. Their characters were those of the Durham, with less fineness of bone and skin. This new race seems to have no advantage over the cross-breed of the Durham and Normand. The amelioration of the race Normande, in view of its chief aptitude, can only be obtained by selection.

THE BRITTANY BREED.

The race Bretonne occupies nearly exclusively the five departments which are comprised in the ancient province of Bretagne, consisting of the departments Côtes-du-Nord, Finistère, Morbihan, Loire Inférieure, Ille-et-Vilaine. Bretagne possesses only one race of cattle, the race Bretonne—strange coincidence in France, where each province numbers many breeds among its stock of cattle. This breed is very numerous and contains about 1,500,000 head of cattle, or about one-eighth of all the cattle of France.

It presents varied developments according to the fertility and cultivation of the soil where it is found, but everywhere is found some type that indicates its origin from the department of Morbihan.

Origin.—Various origins are given to the race, such as that it is a degradation of the race Hollandaise; that it came from the Indies, on account of its similarity to the milch cows in the neighborhood of Bordeaux, which are supposed to have had such an origin, &c. The best authorities, however, agree that the race Bordelaise, as this race is termed in the neighborhood of Bordeaux, and which resemble the Hollandaise race, is nothing but the race Bretonne more developed by means of more abundant and substantial food.

Characteristics.—The ancient race Bretonne is pie-black or black in color. The cow may be described as having a black snout, sometimes mottled, rarely white, while the membrane which surrounds the tongue is always white, which is distinguishing mark. Taken altogether the animals of this breed would be classed as follows: Thick set, often found measuring at the withers from 3 feet 2 inches to 3 feet 6 inches;

eye bright; head short, fine, and small; horns ordinarily fine and white at the base, are black at the extremities, varying, however, and are sometimes black or yellow, or entirely black throughout, which latter type of horns is greatly esteemed; they also vary in length and size, the shorthorns being preferred. This cow is long from the shoulder to the buttocks compared with its height, and has short and small neck and little ears, the head perfectly detached; little or no dewlap is noticeable; the withers and back are on the same line; some have these parts large, but they are often projecting; above all, the mammillary veins are large and flexible, and no French race presents more marked type of good milkers.

CARE OF CATTLE IN BRITTANY.

This race is so neglected in its home that it might be almost said to provide for itself. The bulls are few and young and the cows are brought to the nearest.

These cows have no especial care; during the winter they have some hay or straw given them in the morning, before they are sent out upon meager pastures to obtain the complement of their rations; while exposed to cold for many hours, they receive scarcely enough sustenance to preserve life. It is from this cause that the breed is in such a lean condition, while it is proof positive that its native qualities must be very substantial to bear up under such treatment.

The ox of this breed passes through many hands usually before he reaches the butcher. His first owner usually keeps him until he is about two and a half years old, then sells him to another, who works him for about the same length of time. At the age of five to six years this lean animal is sold to another, who endeavors for about two months to put him in flesh, and then he passes into the hands of a fourth, and not unfrequently to a fifth, before he is ready for his last trip, which is to the fair. It would be difficult to push division of labor farther.

In their home it is rare to find these cattle in good condition, but this is a necessary consequence of scanty food; but careful observation shows that the bony system is slightly developed, and that they can be readily and profitably fattened. The weight of the cow of this breed is from 330 to 440 pounds, and an ox from 550 to 770 pounds.

THE BRITTANY COW AS A MILKER.

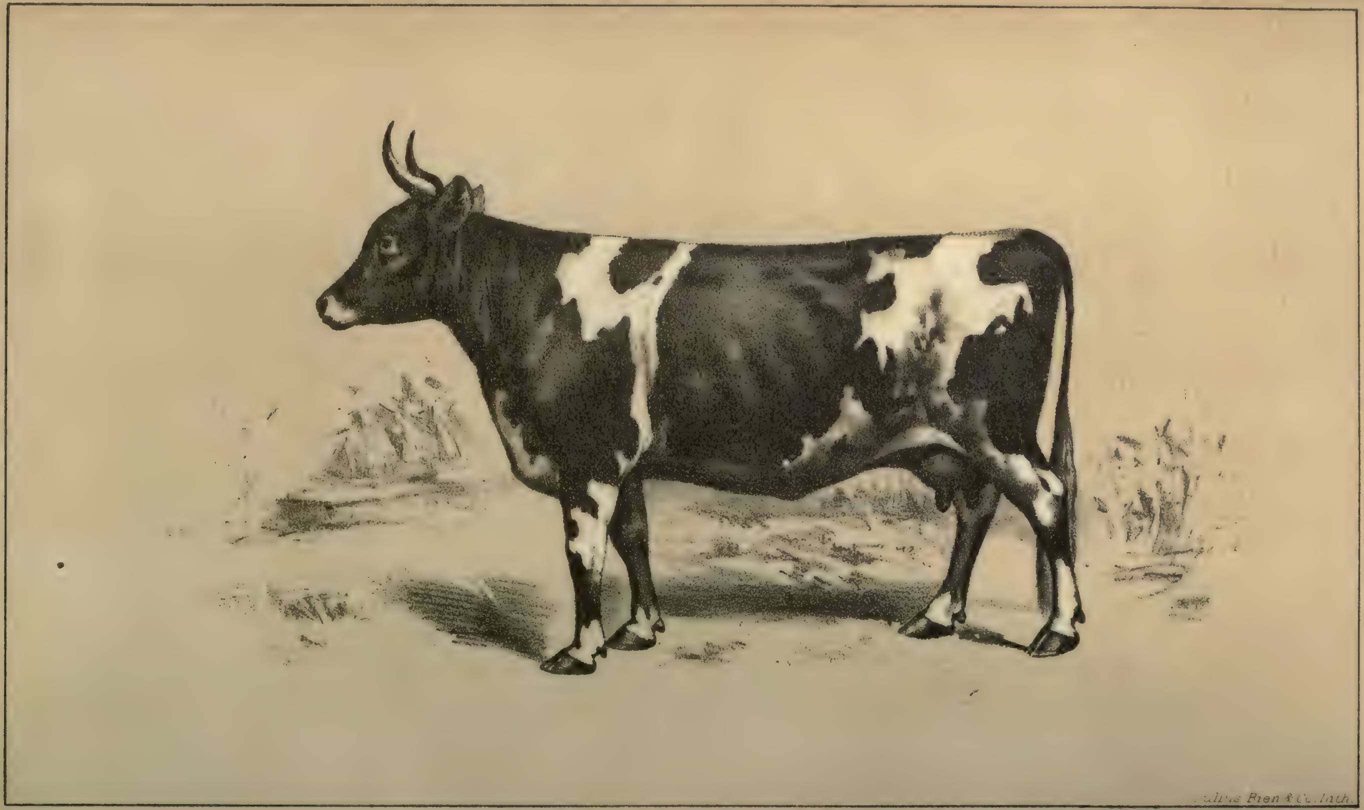
The average quantity of milk is from 1,460 liters to 1,825 liters (1,542 to 1,928 quarts); that is to say, an average of from 4 to 5 liters ($4\frac{3}{10}$ to $5\frac{3}{8}$ quarts) per day. Considering the size of the animal, its usual scanty fare, it must be considered as a good return. The farmers of Morbihan, when asked whether their cows are good, reply, "This one gives 4 pounds, that one 6 pounds, and the other 7 pounds." They mean that such a cow gives such an amount of butter per week.

IMPROVEMENT OF THE BRITTANY BREED.

The attempt has been made to improve this breed by crossing with the Durham and Ayrshire; the result in the former case was good, increasing the weight and precocity of the animal, but without an equally happy result in regard to milking qualities; while the product in the latter case resulted only in producing a less quiet race, of a little larger size and not as good for milk.

The only remedy seems to be in selection, and the amelioration of this breed seems closely connected with the agricultural amelioration

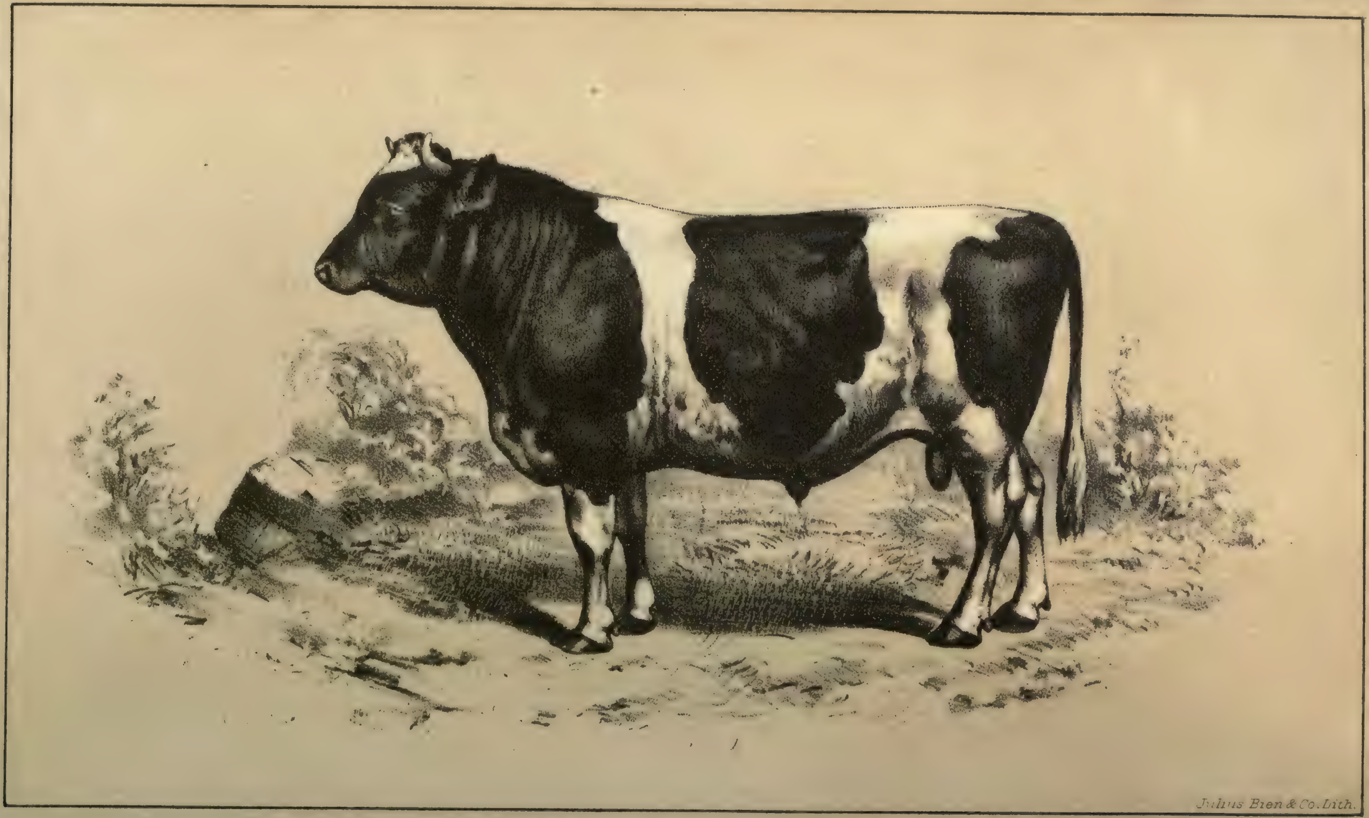
PLATE 86



Julius Bien & Co. lith.

BRITTANY COW

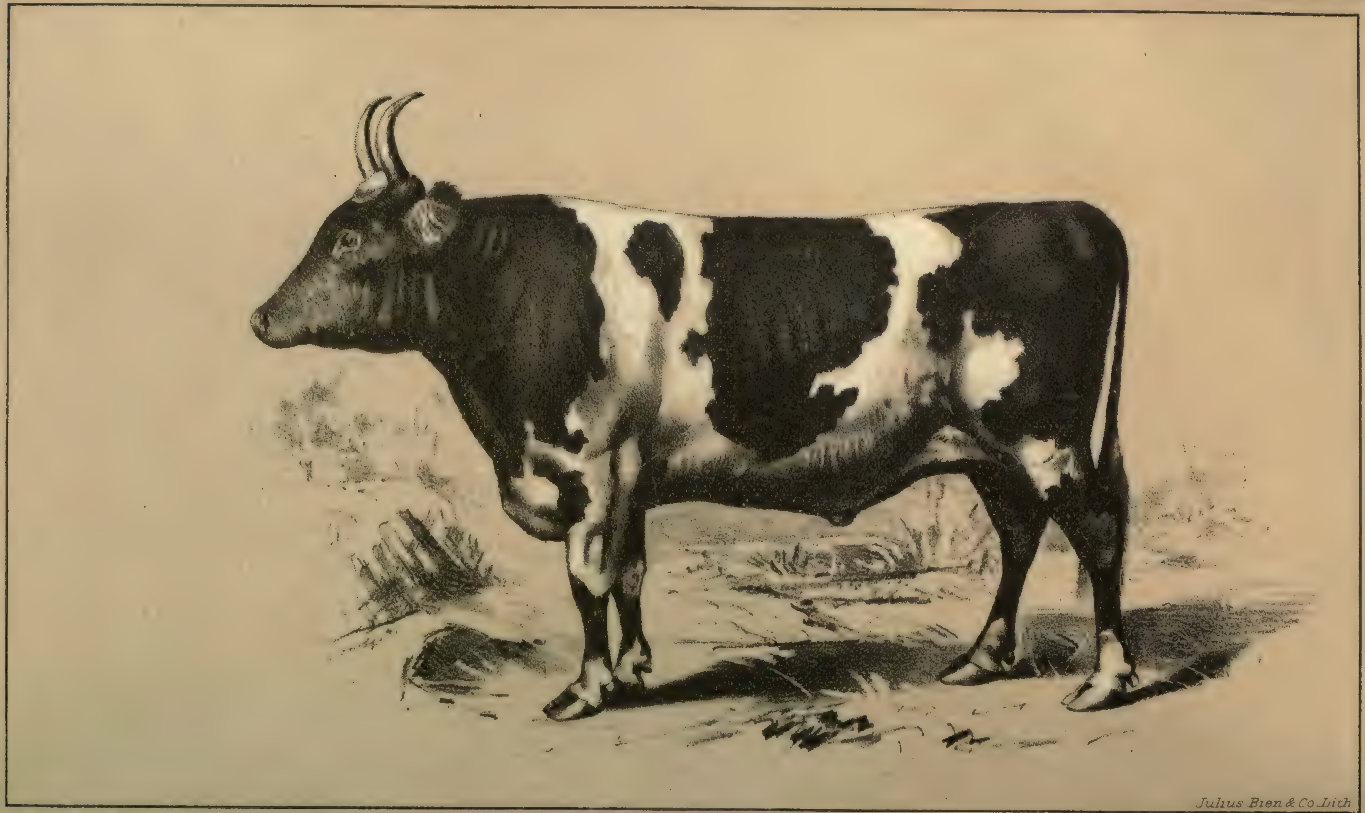
PLATE 87



Julius Bien & Co. Lith.

BRITTANY BULL

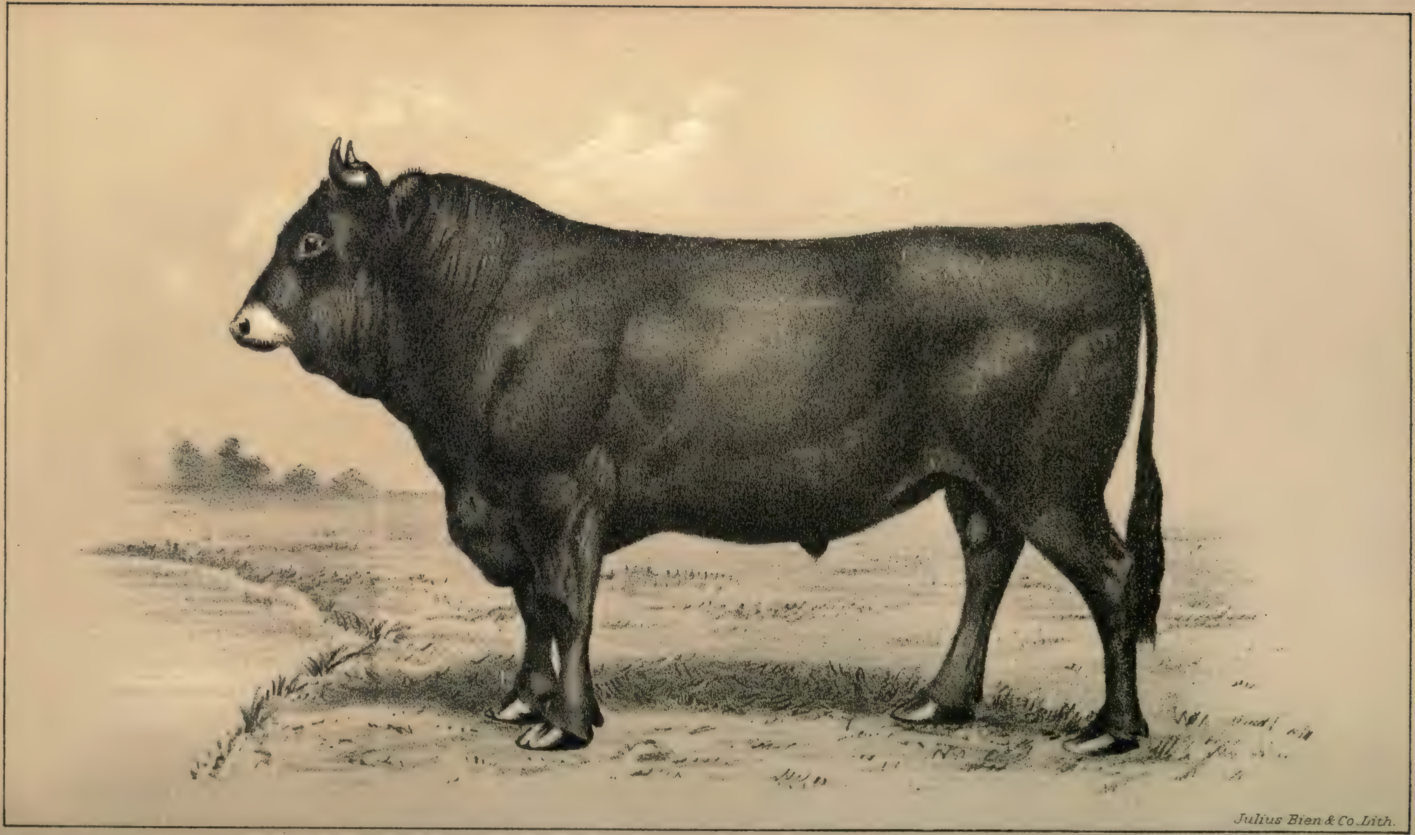
PLATE 88



Julius Bien & Co. Lith

BRITTANY OX

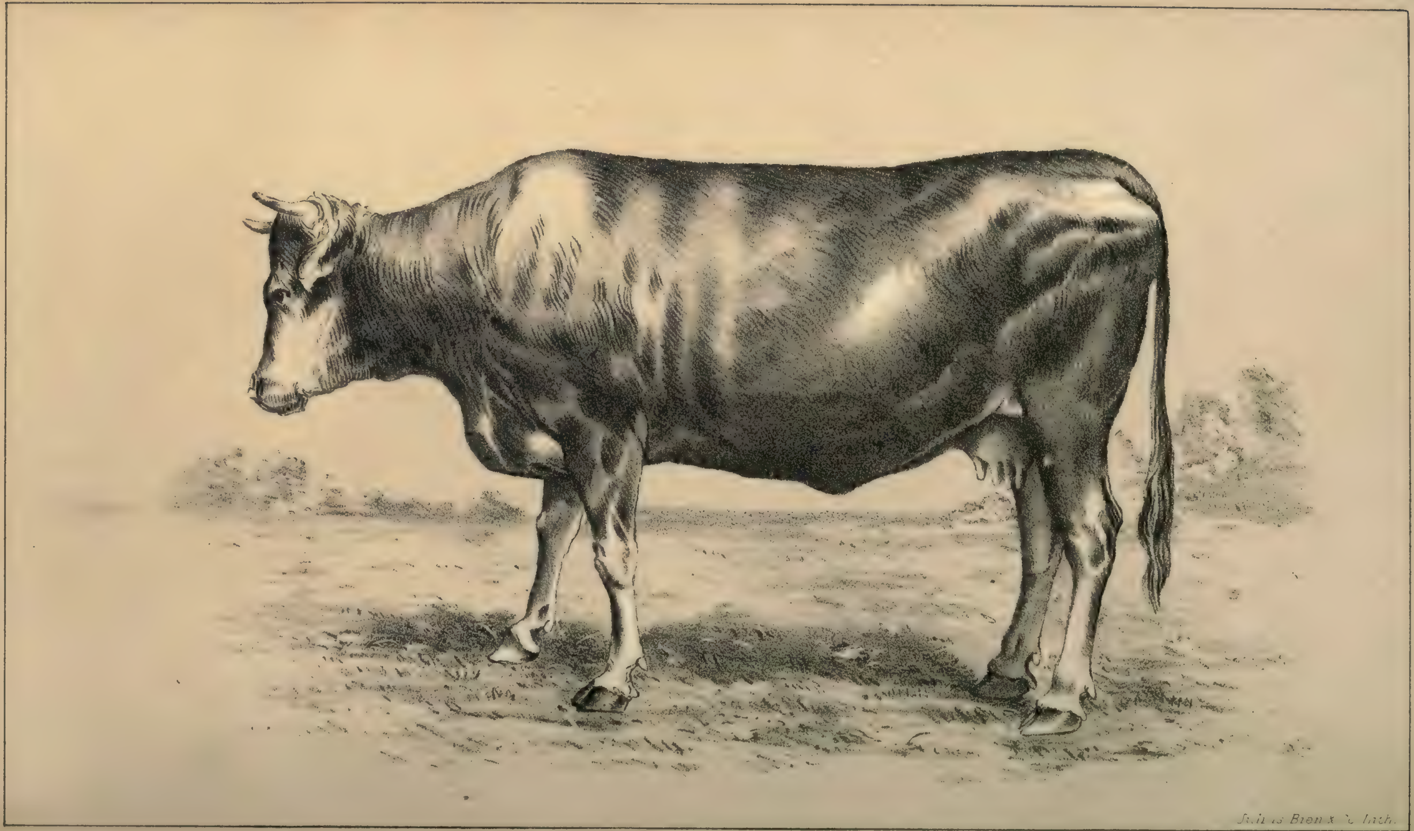
PLATE 90



Julius Bien & Co. Lith.

PARTHENAISE BULL

PLATE 89


Julius Bien & Co. Lith.

PARTHENAISE COW

of the land. It is incontestable that the race Bretonne is the most quiet and hardy of all known races, can content itself on less while giving a relatively high return. It is calculated that a cow of this breed will give a pound of milk rich in butter for each pound of hay consumed; there is no other which will yield a like quantity with less than from two to three times the quantity of food. Again, we must consider that this rich milk is produced under circumstances where others would starve. It has been justly styled the "race Bretonne," useful to the rich and the providence of the poor.

THE PARTHENAISE BREED.

The name of "race Parthenaise" is applied to designate the different varieties of a perfectly homogeneous breed found upon the shores of the ocean from the mouth of the Loire to that of the Gironde.

These varieties assume different names in different localities, and present modifications peculiar to the nature of the soil, treatment, and other economical conditions, without altering the general characteristics of the race.

In the Loire Inférieure they are called "race Nantaise;" in Poitou, "race Poitevine;" in the neighborhood of Cholet, "Choletaise;" "Vendéenne" in the Vendé; "Gatinaise" or "Bocage" in the country known under the name of Gatine or Bocage; and, lastly, "Maraichine" on the shores of the ocean and the marshes of Saintonge. But the parent stock is that raised in Bocage, an extension of the granite reef which forms the greater part of the peninsular of Bretagne, extending along Bocage and the most wooded parts of the west.

CHARACTERISTICS OF THE PARTHENAISE BREED.

The breed of Parthenay has a large and flat forehead, short head, the chaufrein straight and snout large; the horns are long and tapering, white at the base and black at the extremities; the neck is short and muscular, the dewlap of moderate size, a little thick; shoulders long and muscular; withers long and low; chest deep; ribs often flat and low; line of the back straight; loins large; haunches wide apart; croup horizontal and well furnished with muscles; tail deep set; thighs well muscled and straight; form nearly a square with the projection of the haunches; limbs are short but strong, at the joints large, but very straight. The animals of this breed are heavy, slow, but tenacious, robust, and good workers. The ordinary size varies from 5 feet 9 inches to 5 feet 11 inches. When fattened they readily attain 1,100 pounds, live weight. Their skin is nearly as fine and soft as that of the little race Bretonne, and indicates their aptitude for fattening. The only color admitted for these animals is yellowish brown, slighly varied, as it is sometimes paler, and again approaches claret color. The young animals at birth are brown, which changes as they develop into a lighter tint.

THE PARTHENAISE AS MILKERS AND MEAT CATTLE.

The cattle of this breed, under the names of "Choletins," "Nantais," or "Parthenais," contribute largely to the supply of the city of Paris, and vary in weight, according to age, &c., from 1,750 to 2,250 pounds.

The race is not precocious, but at the abattoirs of Paris butchers told me that they preferred them to the more precocious breeds. The cows of this breed are smaller in size. The cows in some parts are consigned entirely to the duties of maternity, and the least possible amount for the use of the household is alone taken from it. There are found, however, among them some good milkers, notably of the variety Maraichine. The net returns of the product of meat are more than average; the quality is fine, and the capacity for work constitute this race among the first rank of the French breeds.

THE CHAROLAISE BREED.

The race Charolaise is justly regarded as one of the most important races of France. It is precocious, vigorous in work, and excellent for meat. The cow has never been remarkable for its milking qualities. The name given to this breed of "Charolais" or "Nivernais-Charolais" is identified with the name of the place of its origin, and "Nivernais" perpetuates the name of the department where this race to-day has its center of development, and where the finishing touches have been put upon it.

The Charolais has been termed the Durham of the French race, and it has in a less developed degree the prominent characteristics of that breed, so that a description of that well-known breed would answer for this one. The same lightness of head, fine skin, large haunches, straight line of back, and short legs are found in the one as in the other. In the Durham, however, the bones are small, the legs are slim, and the animal is totally unfit for work, while the Charolais, of firmer bones and strong legs, is well fitted for the work. The Charolais, is at the same time suitable for work and valuable for the butcher. Finally, the Durham demands abundant and substantial nourishment and permanent stabling, while the Charolais, in contrast, is far more hardy, lives and thrives upon herbage, and is only stabled during the most inclement portion of the season. Nevertheless there exists an affinity between these two races which assures success in crossing them, but only in increased precocity in fattening.

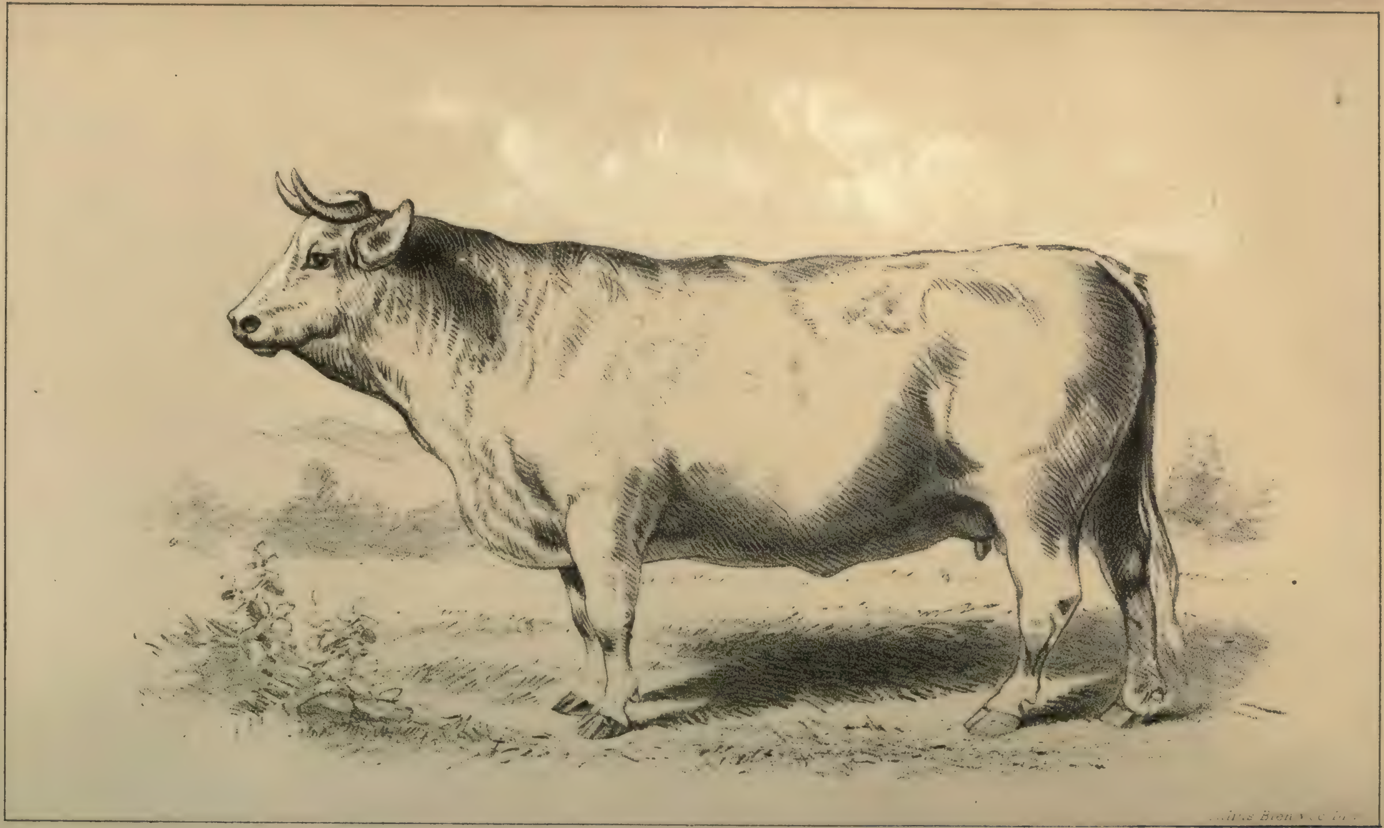
The breeding with Herefords proved a failure, injuring their qualities for work, and rendering them more exacting in quality and quantity of food, and on the whole less robust. A constitution of resisting contagious diseases is peculiar to this breed. The cows fatten more readily than the oxen. These cattle are brought into this region in large numbers to fit for the butcher.

THE LIMOUSINE BREED.

Those who have examined the race Limousine in Limousin attest the wonderful change that intelligently directed care has effected in the amelioration of this breed. At the recent fair at Paris, where I counted 47 cattle of this breed among a total of 332, they compared favorably with any on exhibition, and the butchers said that the net returns of meat were very large, being from 66 to 69 per cent.

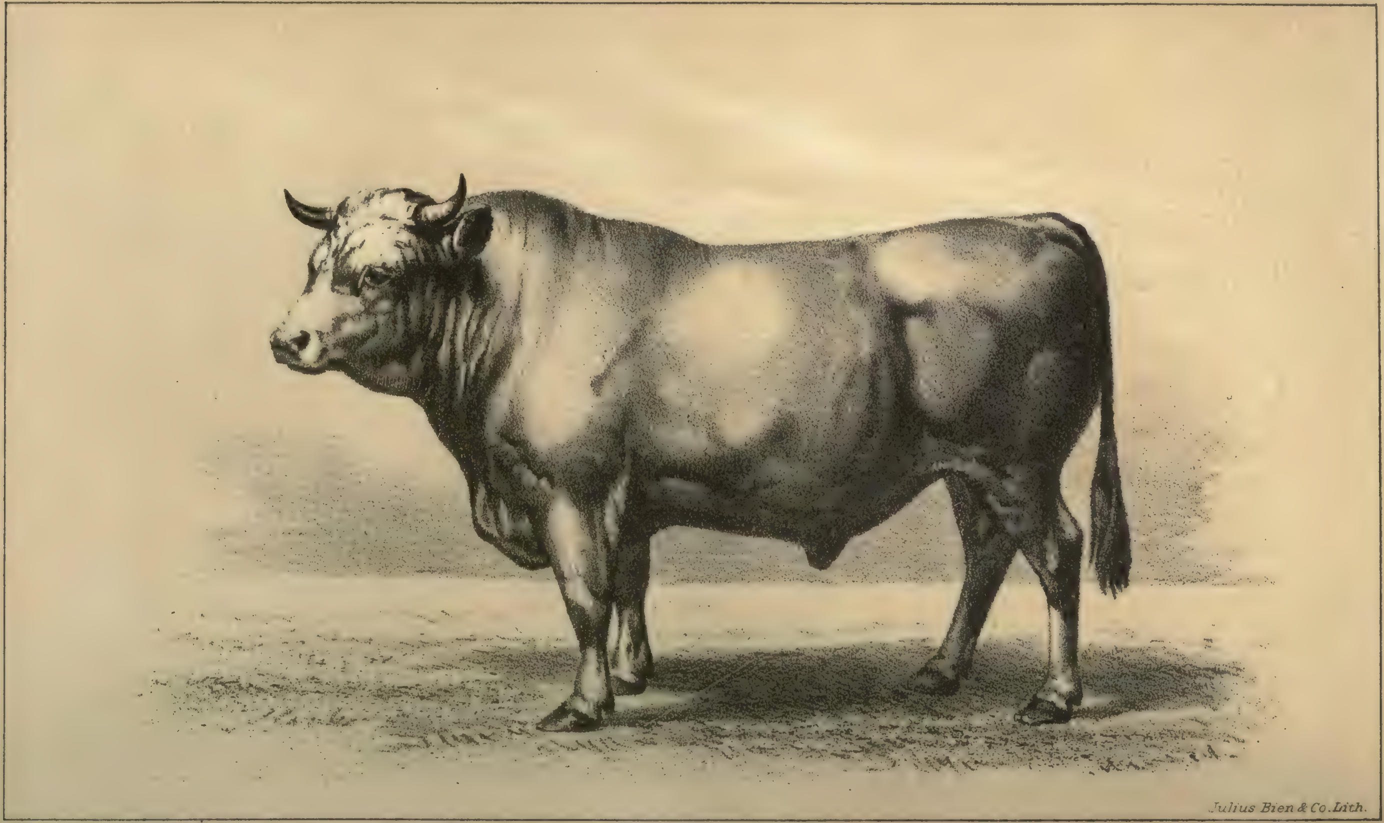
The Limousines of the mountains are, on the contrary, of small size, hardy, and yield at the abattoirs only moderate returns. It is said of the cattle, as of the inhabitants, that destiny impels them to emigrate. Emigration has caused the improvement. The Limousin ox has a yellow coat, paler on the inner side of the limbs; large yellow horns, which describe a semicircle; large, bright, mild eyes; moderate-sized head, the neck well proportioned to the rest of the body, the dewlaps falling nearly to the ground; haunches well formed; flank low; thighs round;

PLATE 91


Julius Bien & Co. lith.

CHAROLAISE COW

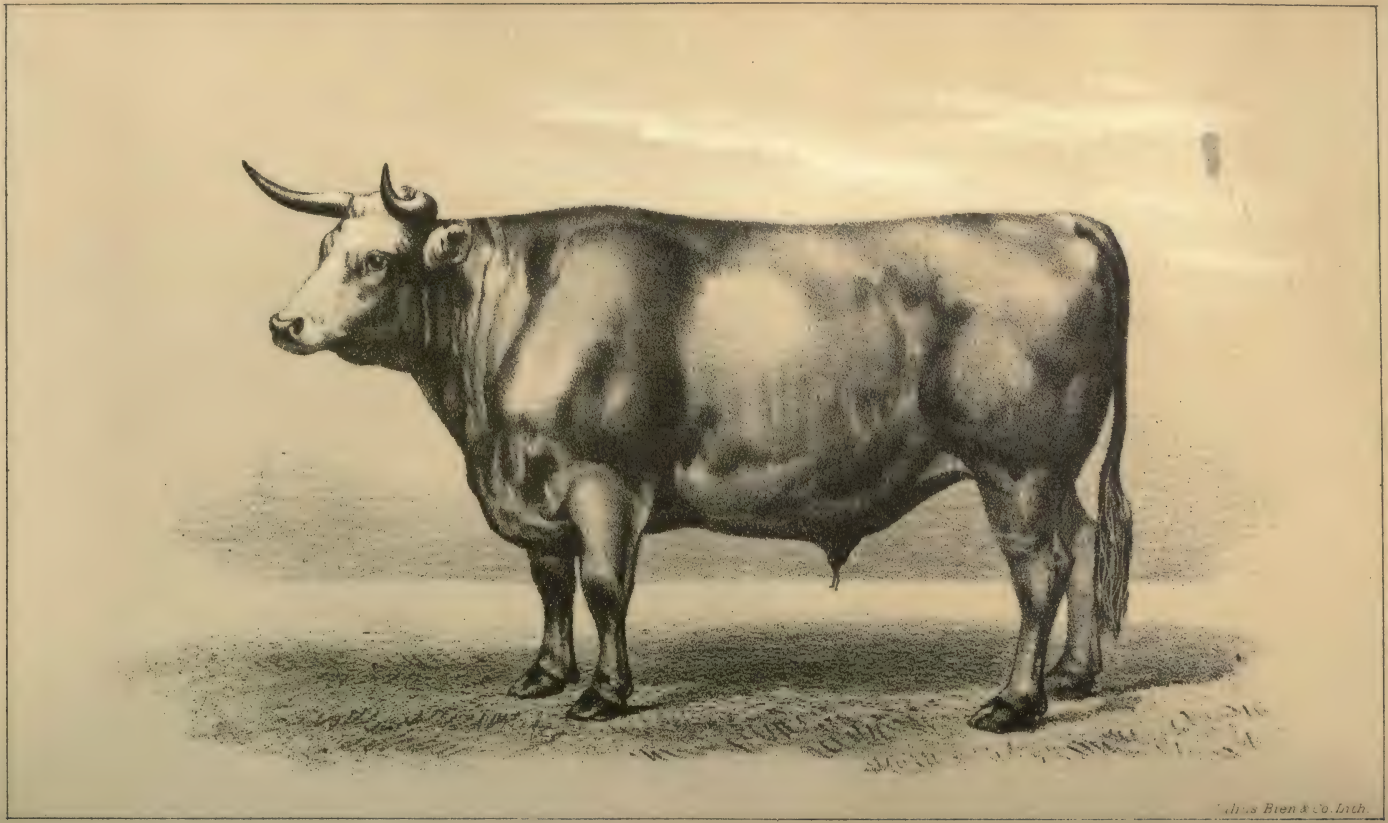
PLATE 92



Julius Bien & Co. Lith.

CHAROLAISE BULL

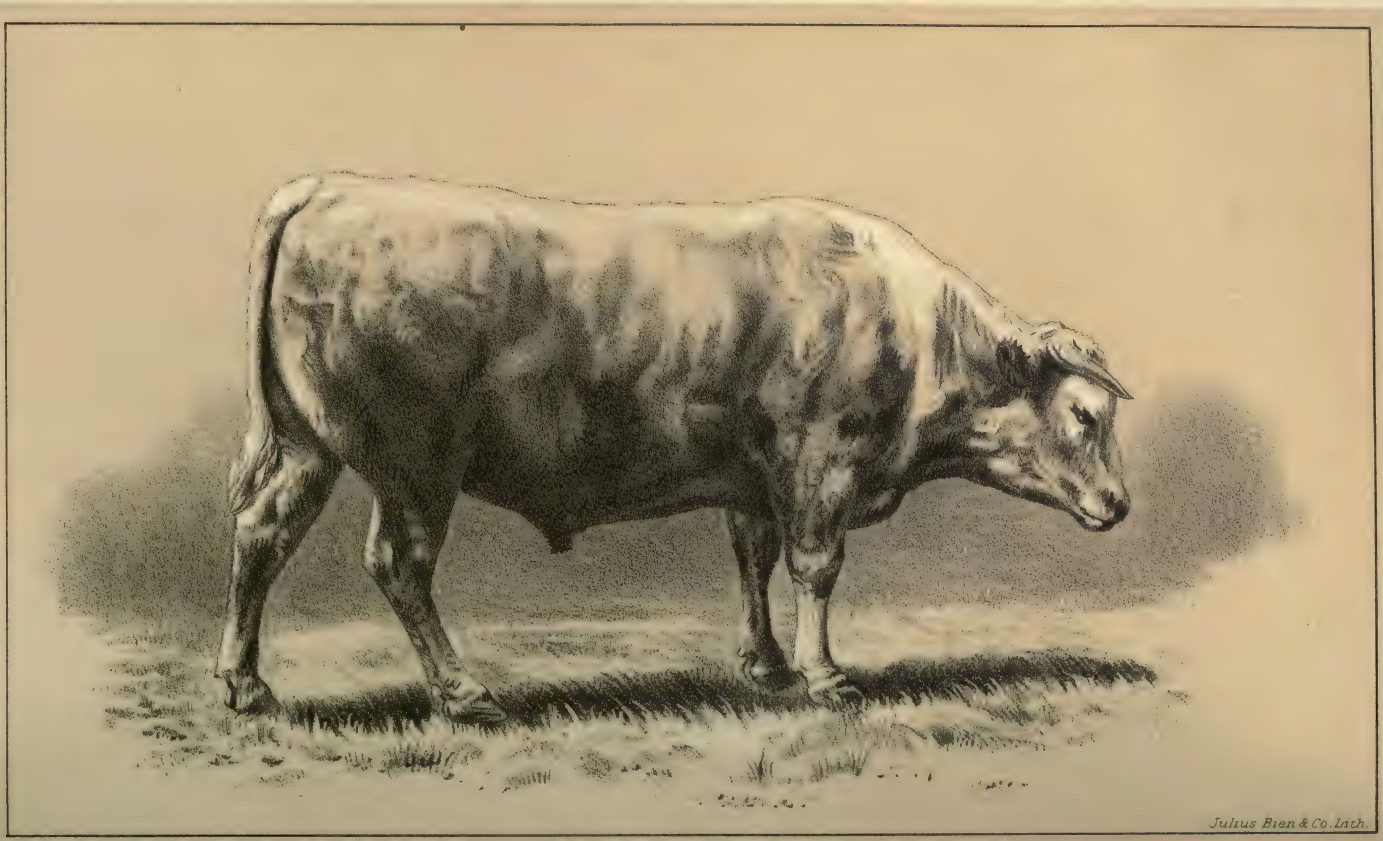
PLATE 93



Julius Bien & Co. Lith.

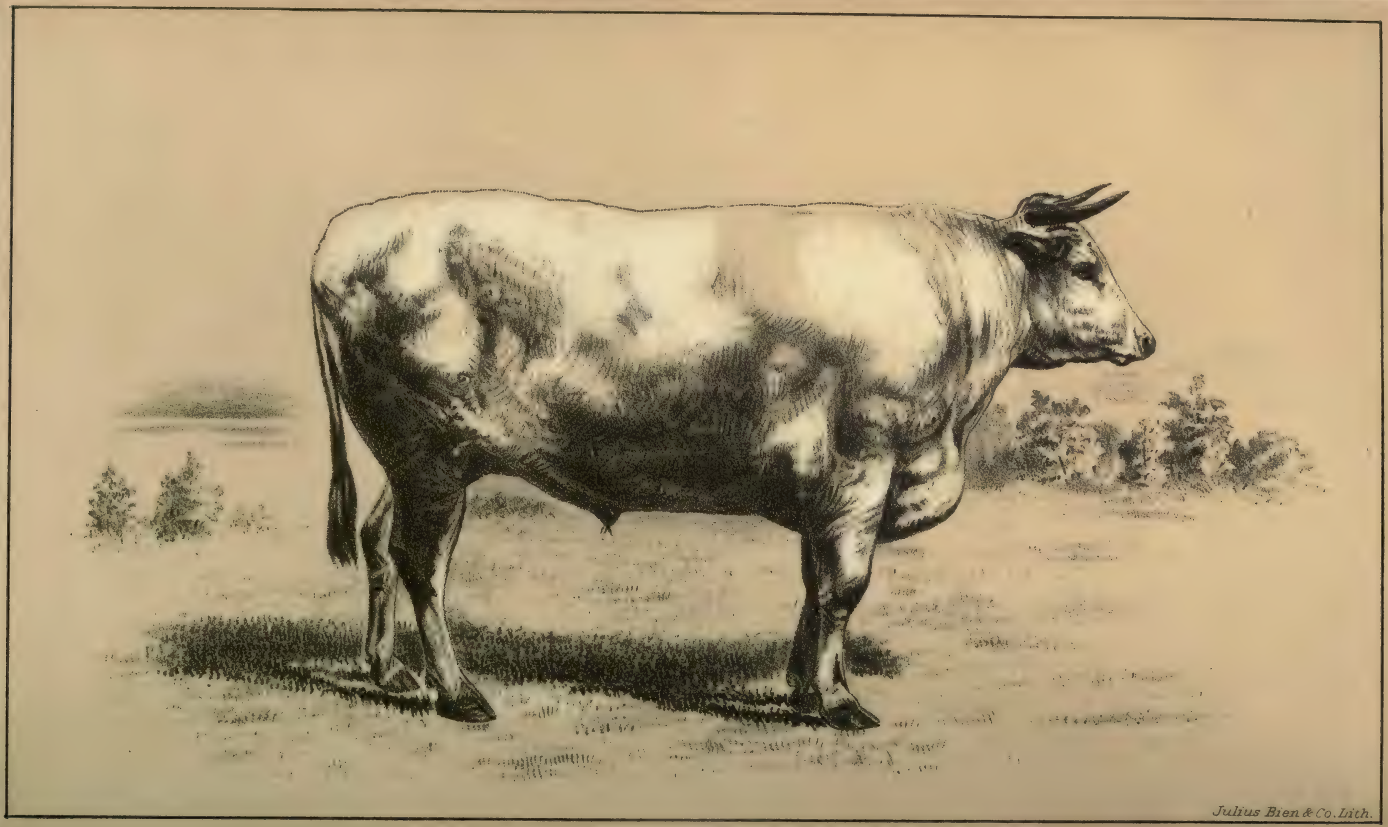
CHAROLAISE OX

PLATE 94


Julius Bien & Co. Lith.

"A PRIZE CHAROLAISE OX", 3 YEARS 10 MONTHS OLD.

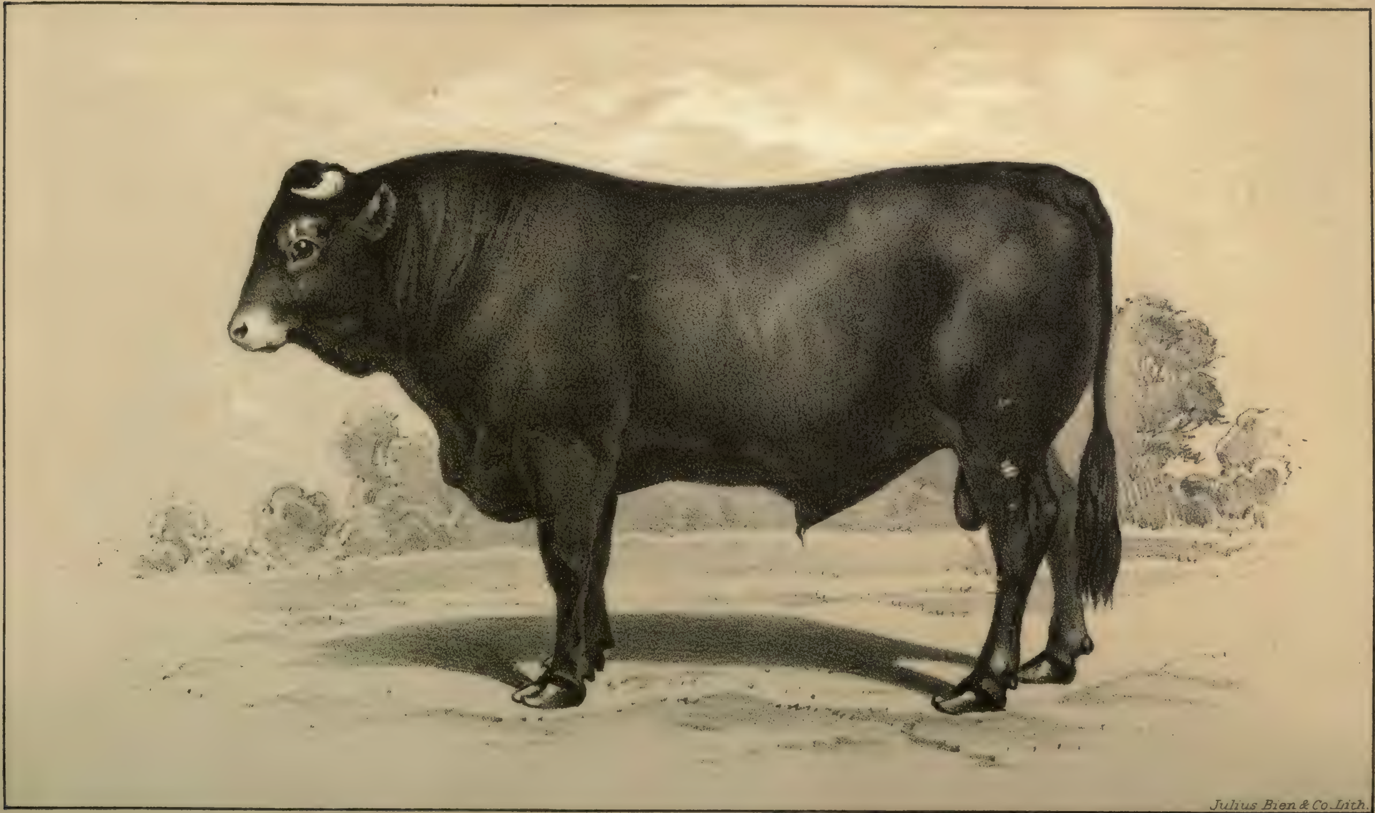
PLATE 95



Julius Bien & Co. Lith.

"A PRIZE DURHAM-CHAROLAISE OX", 3 YEARS 10 MONTHS OLD.

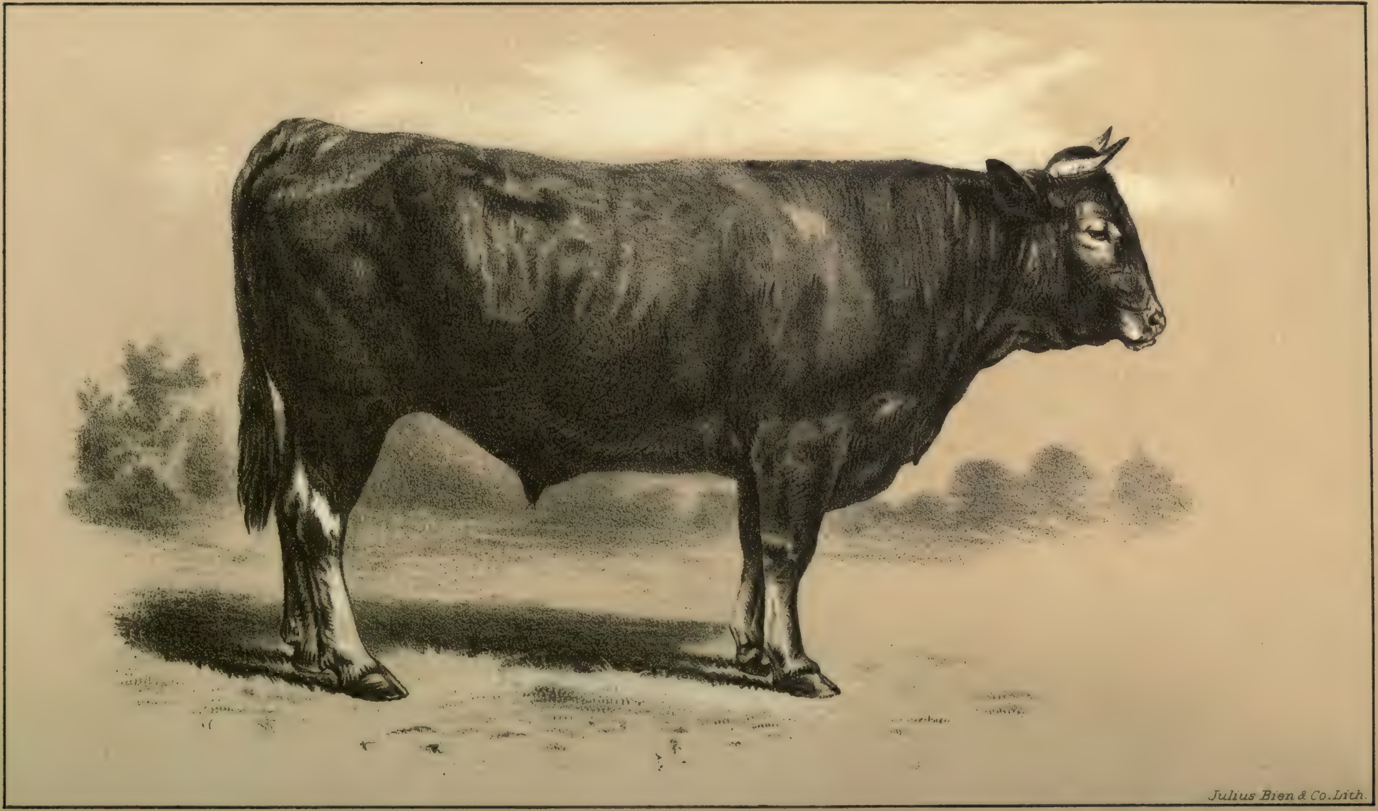
PLATE 96



Julius Bien & Co. Lith.

LIMOUSINE BULL

PLATE 97

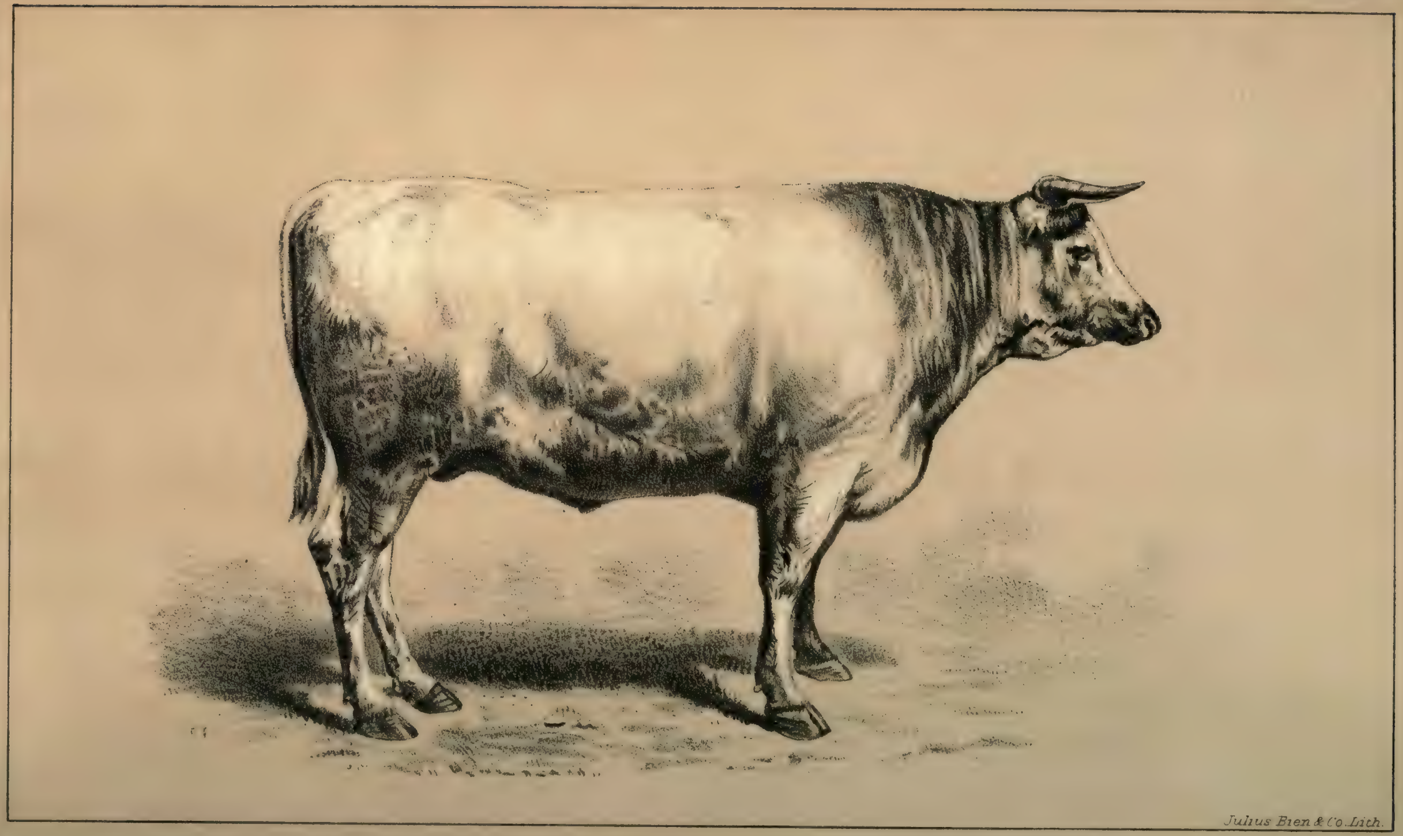


Julius Bien & Co. Lith.

LIMOUSINE PRIZE OX

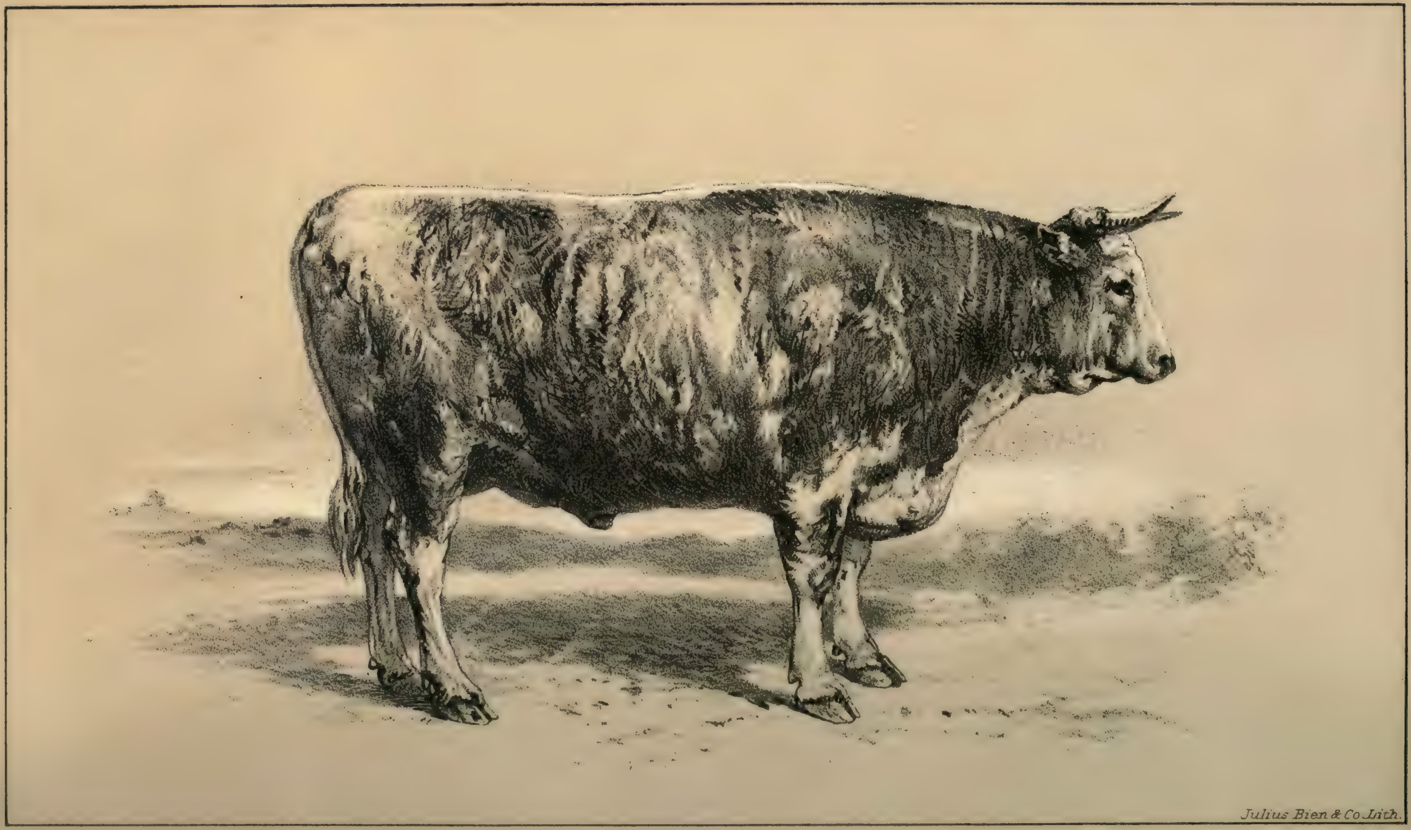
LIBRARY
OF THE
UNIVER
OF
CALIFORNI

PLATE 100


Julius Bien & Co. Lith.

DURHAM-MANCELLE PRIZE OX

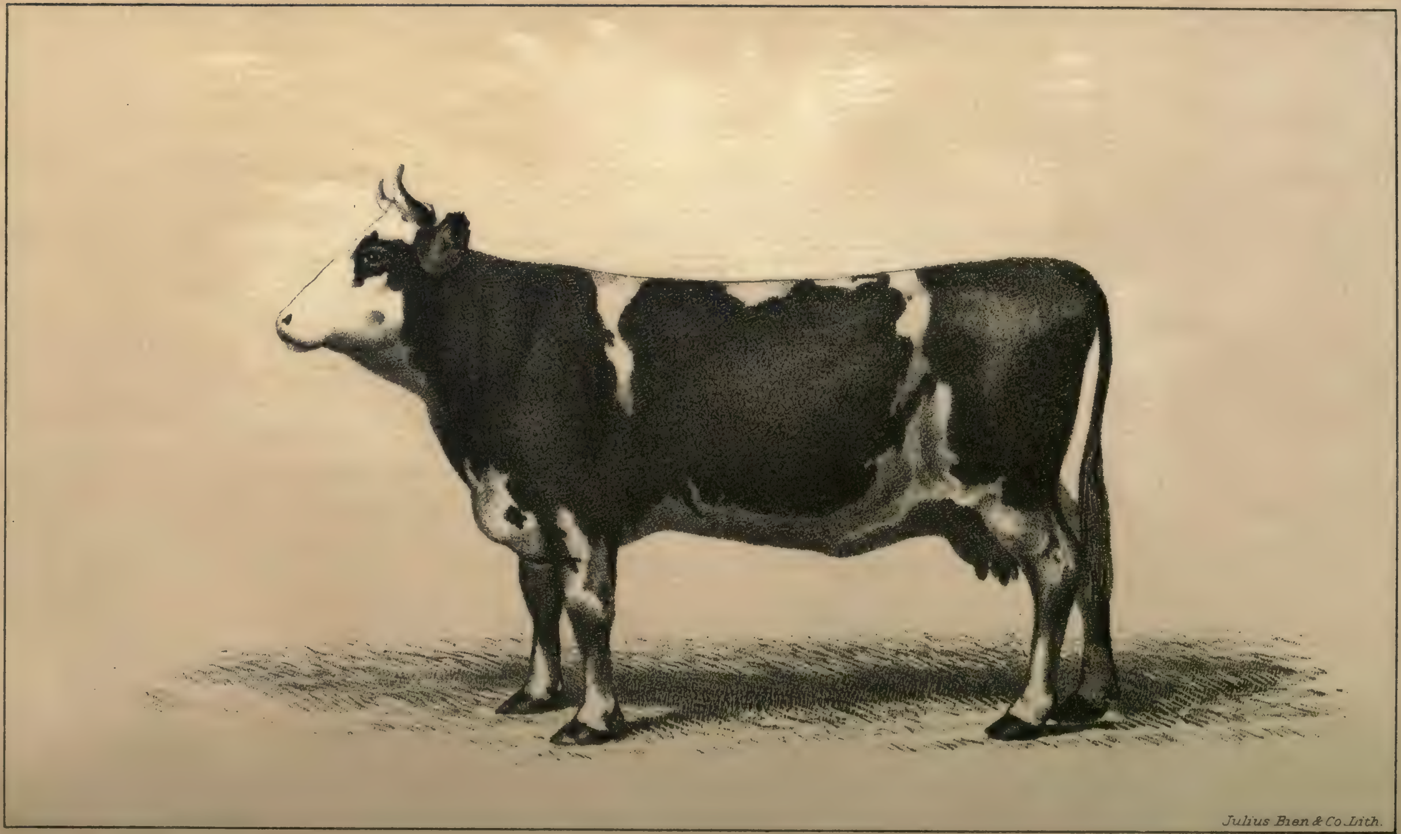
PLATE 99



Julius Bien & Co. Lith.

DURHAM-MANCELLE PRIZE OX

PLATE 98



Julius Bien & Co. Lith.

MANCELLE COW

shin large; good foot; good gait and easy movement. Their docility is very great and highly prized. They walk slowly and husband their strength while they do their work. The cow is much smaller than the ox, and is remarkably feminine and very fine in limbs. The head is expressive. She has great energy and works more briskly than the ox, but lacks his endurance.

The difference of size between the ox and cow of this breed is easily explained by reasons which I gave above. The cow remains in her home in her original state, while the young ox at the age of twelve or fifteen months is taken into the rich and highly cultivated portions of the country. He receives better and more substantial food; his native qualities are developed; the animal grows and thrives under the better surroundings. The mild treatment and painstaking of the driver insures the docility of the oxen. They are seldom strained; and as the farmer expects the greatest return from the growth and increase of weight of his cattle, it is not unusual to see a cart drawn by three or four pairs of oxen which could be moved by one pair.

The cows work in their homes in the mountains, and are able to turn up the light soil upon which are raised rye and buckwheat. She is only a moderate milker, not equal to those of the breed de Salers, occupying the neighboring mountains. Some attempts have been made to improve this breed by crossing with the Durham, the Charolais, and Gascon. The result of the former was generally good, but less aptitude for work, and with the others occasioned loss of that docility which is of great value to the pure breed.

THE MANCELLE BREED.

The race Mancelle is destined to disappear. The pure breed is only found among some poor farmers, and then of an inferior type. It is difficult to study the pure breed, and scarcely interesting or instructive. I have succeeded in obtaining a cut of this race. Although capable of work, they are rather classed as ordinary workers. The Norman graziers said that they often turned them into their pastures long after the others, but they were the soonest fitted for the market of the capital.

A short cut was discovered to utilize this race by developing it and at the same time exterminating it, or rather substituting for it a superior breed.

The early attempts to introduce the Durham blood to ameliorate this race were so successful, and the transformation so great, that it may be considered as a great stride in advancing the value of French cattle. The "Durham-Manceaux," as this breed is termed, has increased the precocity and propensity for fattening to a degree (as claimed by many) of superiority to all other cattle of native or crossed breeds. However this may be, from the study of these animals, which were very numerous at the recent annual exhibition of animals for the butchery, as well as among the most successful breeders and fatteners of cattle, the fusion of these two bloods has produced excellent results, such as increased precocity, lighter bones, more developed fleshy parts, fuller chest, while diminishing the belly and rendering the ribs more cylindrical; the neck becomes shortened and the head finer. The Durham blood can also be successfully renewed in the Durham-Manceaux, and with such happy results and direct proof as the list of prizes taken by these cattle for many years attest.

The returns of net meat from the Durham-Manceaux is large, varying from 65 to 72 per cent., weight from 2,100 to 2,400 pounds, at three years ten months of age. The Durham-Manceaux must be considered one of the most valuable breeds which France possesses for food.

THE COMTOISE BREED.

Among the many mixed races of the northeast of France is found a fixed and numerous breed named the "race Comtoise." These have three different varieties, known as "Tourache," "Femeline," and "Bressane." They occupy the mountainous parts of the east of France, from the Vosges to the Alps, the valleys of the basin of the Saone, and the department of Ain.

The variety Tourache tends to disappear. Its continual mixture with the Swiss races serves daily to efface the type more and more. The proprietors of the rich pasturages of the Jura have long been in the habit of loaning to the Swiss 4,000 to 5,000 cows for the summer season, at $10 per head. This periodical emigration has been the means of infusing much Swiss blood into the pure breed. This renders the study of this variety useless. In the local fairs the three varieties are classed together as Comtoise, although, for reasons shown above, the Tourache is fast disappearing; the Bressane is formed of variable elements; the Femeline alone presents a satisfactory type of a race.

THE FEMELINE BREED.

The race Femeline has a light brown coat, head small and narrow, eyes set near the horns, soft and mild air, fine horns, slim neck, small ears, small dewlap, fine limbs, the ribs well rounded, bones sufficiently light, skin thin and loose at the shoulder, which indicates an aptitude for fattening. The Femeline ox is docile, quick in his movements, has a fair aptness for fattening, and is a favorite with the butchers.

The husbandman keeps his oxen till seven or eight years of age, then puts them in the stables for three or four months, and partially fattens them by feeding them with the after-grass, potatoes, and turnips, cooked and mixed with rye flour, maize, and even with wheat of inferior quality, diluted in water; he also gives them some rape-seed cakes. He then sells them to drovers, who supply Lyons, Côte d'Or, and even Paris. The figures of these annual sales are from 8,000 to 10,000 animals, at an average price of about $80 per head. Their weight is from 660 to 880 pounds, and the percentage of net meat often rises to 60. Although a good breed and superior in milking qualities to the Charolaise, the latter scarcely giving enough to sustain its calf, the ox Femeline cannot be compared to the Charolaise, with or without the Durham mixture, for in the Durham-Charolaise it is difficult to ascertain where the blood of the Durham begins and that of the Charolais ends.

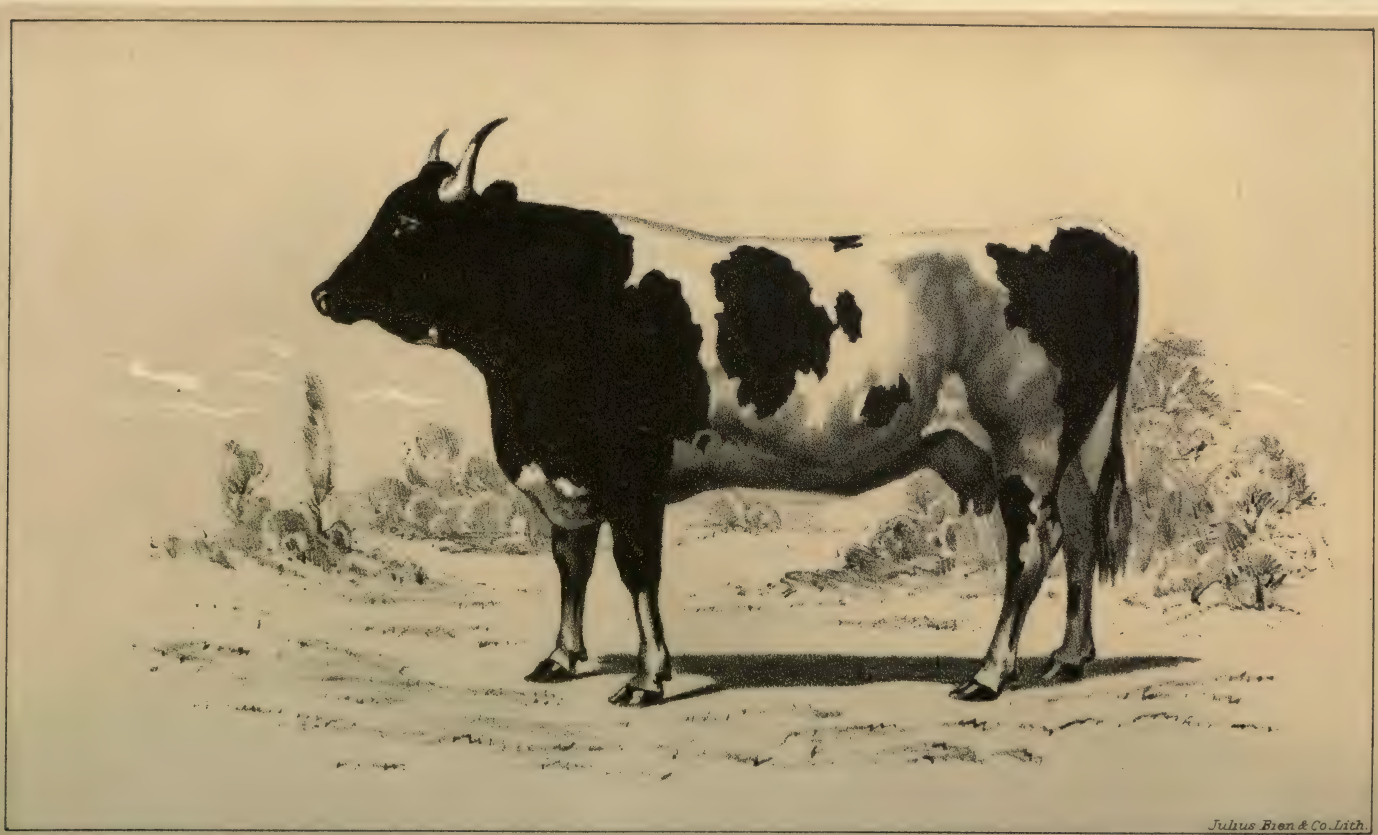
The variety Bressane is a coarse specimen of the race Comtoise; has its merits as an excellent animal for work, and when even quite old, before it is fattened, is still sought for by the butchers, its flesh being very savory and esteemed in the market of Lyons.

In the annual exhibitions of France this variety Bressane has often taken the prizes, and I herewith insert a cut of one of these prize animals.

THE SALERS BREED.

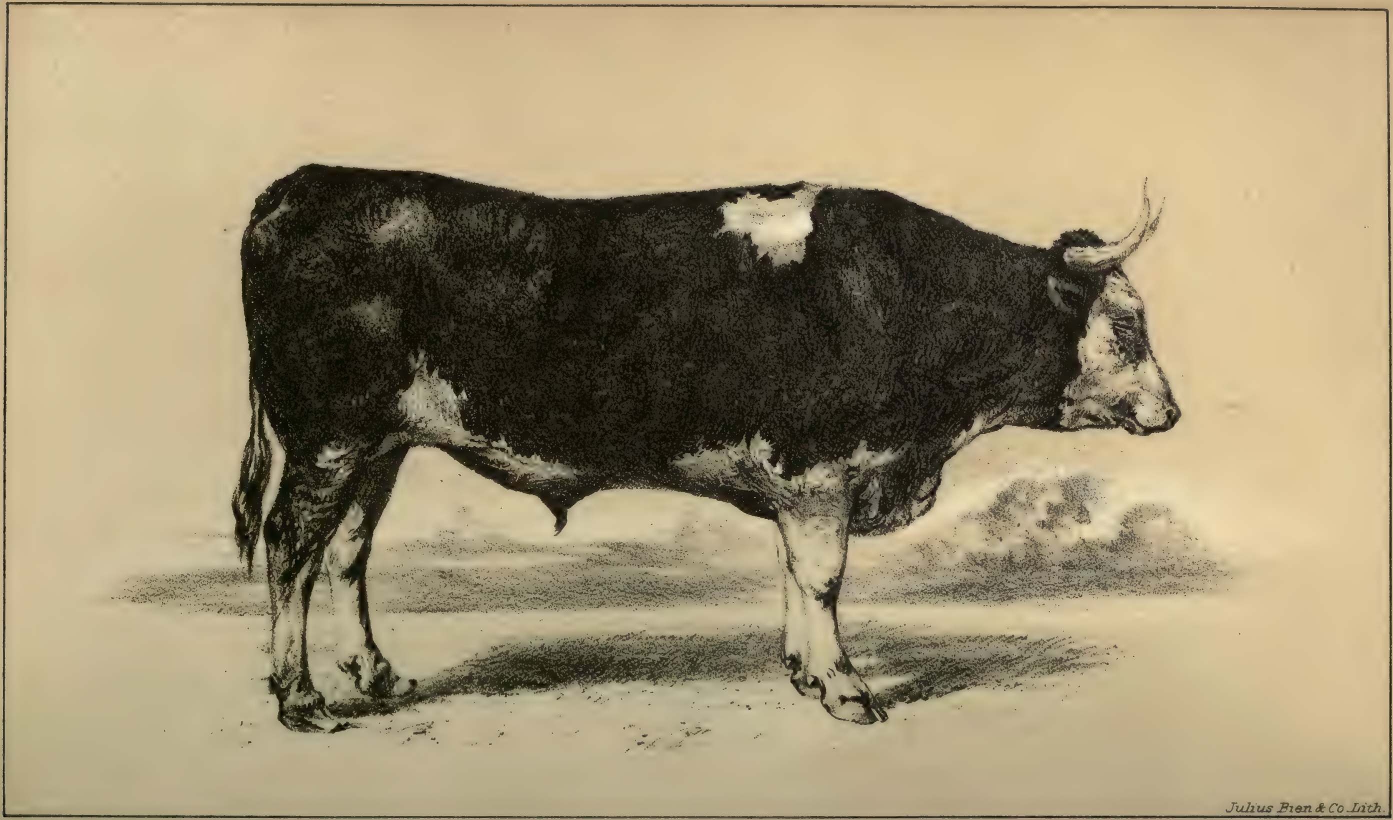
The race de Salers is one of the oldest in France. It has always been held in good repute. This breed presents the three qualifications desired, but seldom united in the same animal—aptness for work and

PLATE 101


Julius Bien & Co. Lith.

COMTOISE COW

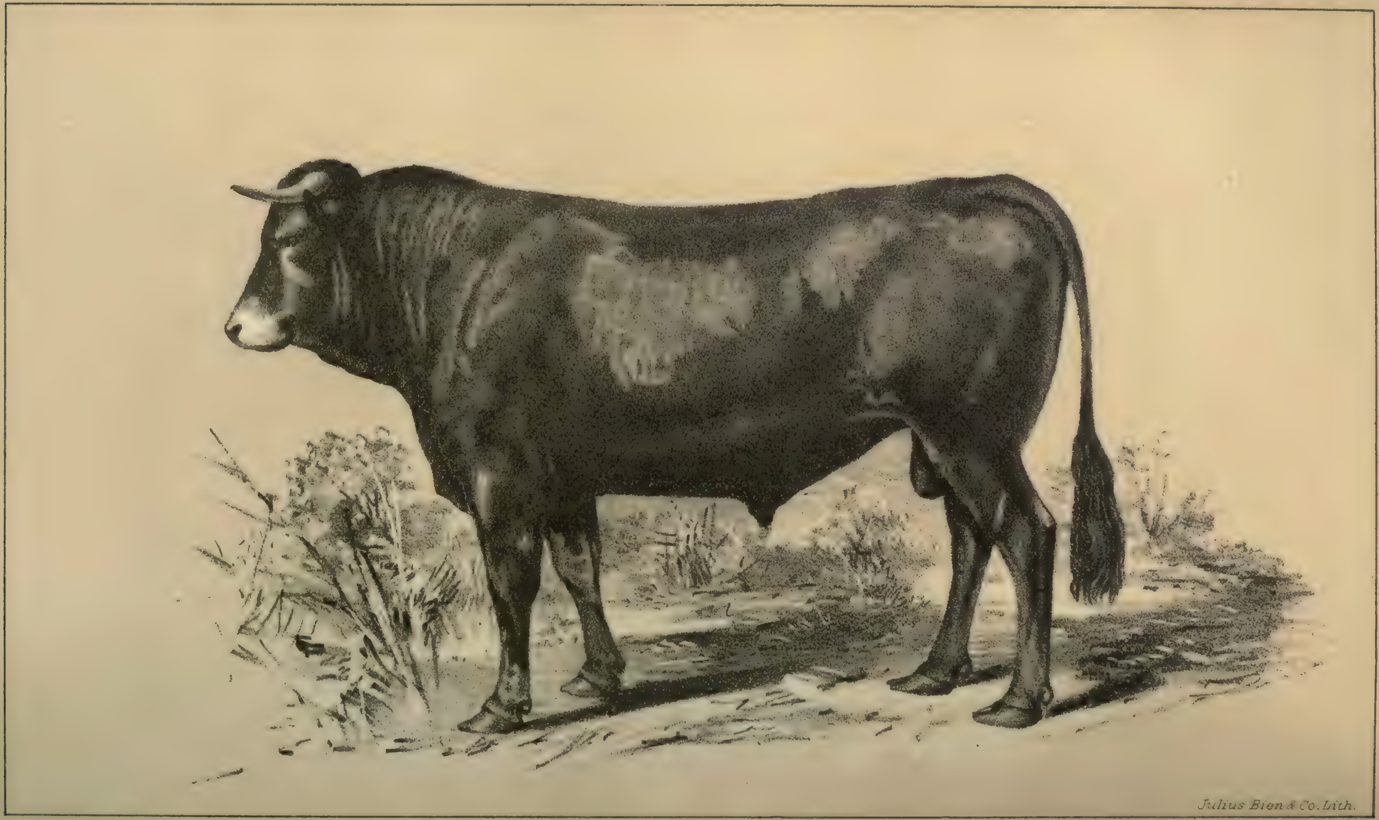
PLATE 102



Julius Bien & Co. Lith.

COMTOISE PRIZE OX

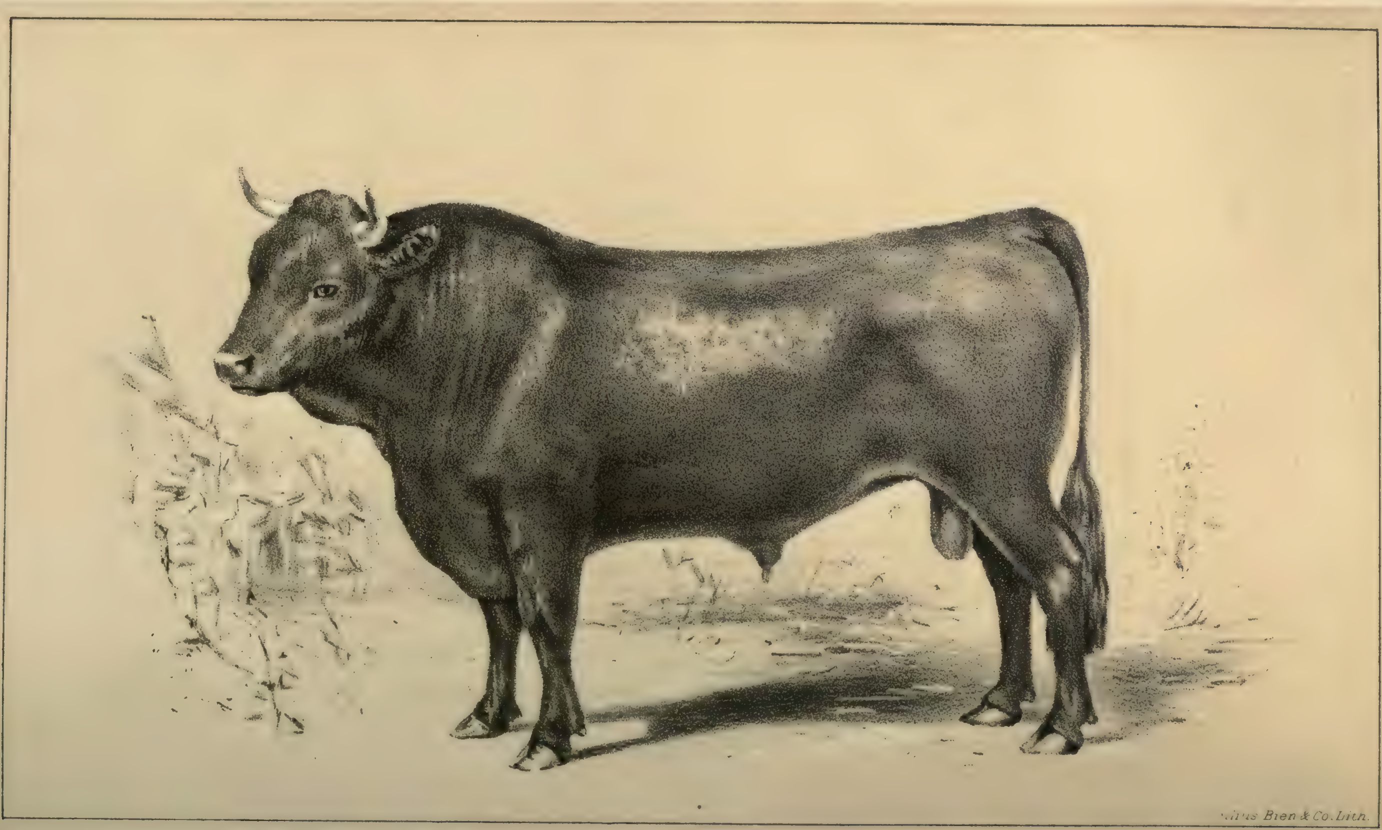
PLATE 103



Julius Bien & Co. Lith.

FEMELINE BULL

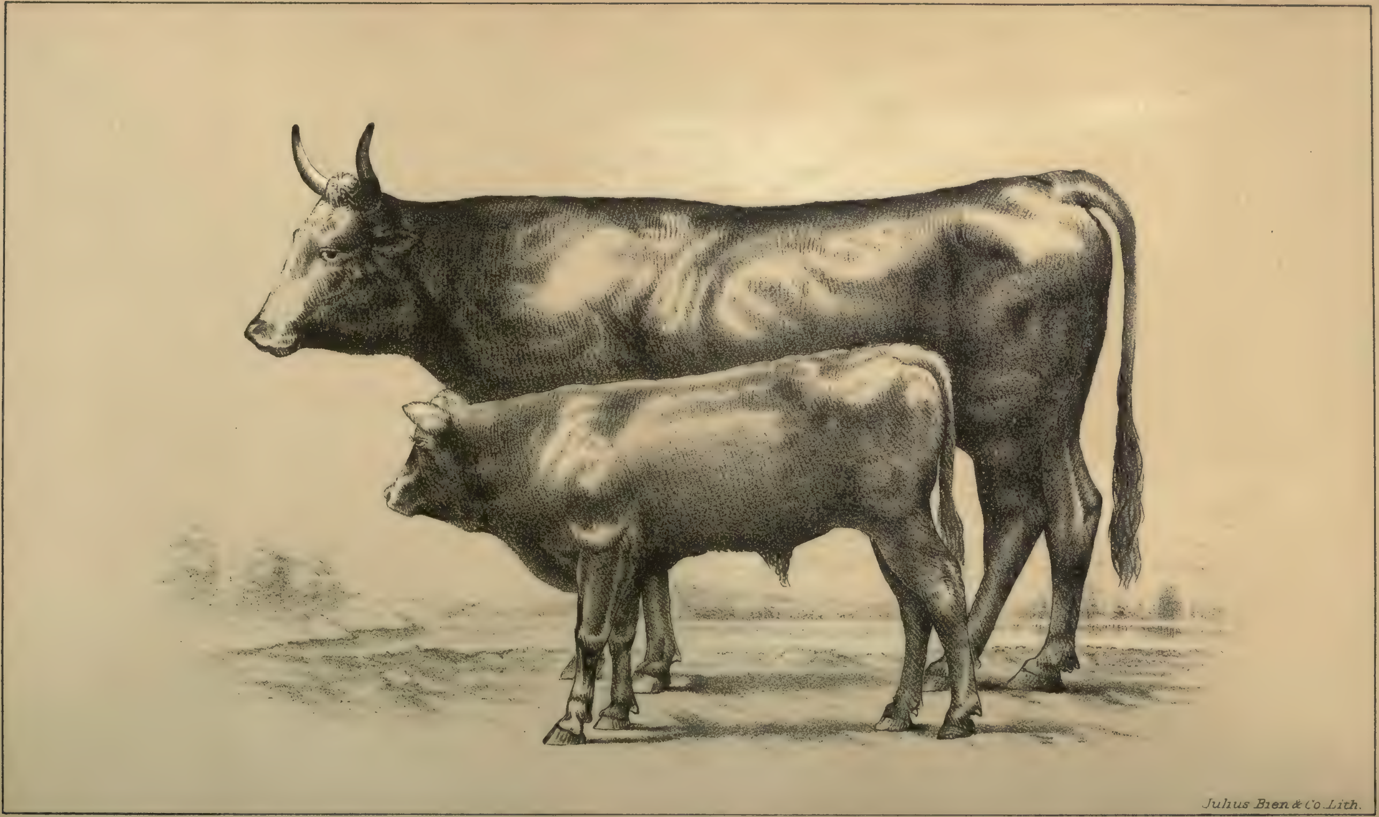
PLATE 104



Julius Bien & Co. Lith.

SALERS BULL

PLATE 105



Julius Bien & Co. Lith.

SALERS COW AND CALF

fattening joined to good milking qualities. Besides, it is intelligent and docile. Briefly described, it is from 4 feet 2 inches to 4 feet 6 inches size; live weight, 1,750 to 2,250 pounds; fine, soft, shiny coat, generally red, without spots; fine, supple skin, loose from the ribs; long, slim horns, ordinarily white, wide apart, shooting upwards and backwards toward the end; short head; large forehead; bright, mild eye; good-sized neck; dewlap is moderate; shoulders strong and chest well developed; limbs muscular, fairly strong; are lusty, vigorous, and straight, so formed as to insure a brisk gait; the Salers is often observed trotting like a horse; his body is thick-set and his belly well developed. The name is derived from the little city of Salers, district of Mauriac, situated in the midst of the mountains of Cantal.

Although they occupy a small territory, they manage to export many of these cattle. The oxen are first sold to the neighboring departments for work, and finally they are sold to those who fatten them and thence to Paris. The cows emigrate south and are sought for dairy purposes. At the recent fair for animals for food at Paris the race de Salers, as usual, was well represented. Many of these cattle attain great weight, at the age of five years often running from 2,000 to 2,700 pounds.

The heifers, as remarked, are sold to the south of France, enough only being reserved to replace the superannuated cows of the dairy; others, again, are sold in pairs for working cows.

DAIRYING ON THE CANTAL MOUNTAINS.

A dairy in this part of France consists of about 35 cows, varying however from 20 to 100 cows each. A certain amount of mountain pasturage is required for this dairy. These domains upon the mountains contain 800 acres or more and pasture several dairies. The milk is made into cheese—at home in the spring and fall, when the cows are on the farms, and on the mountains when the cows repair there during the summer. The mountain is utilized as a pasture as long as possible; then the cows descend to the farm and live upon the late vegetation. This devoured, they go into winter quarters in the stables. The pasturage of the mountains is gauged by the number of head it can feed. They say a mountain of 40, 50, or 100 head, to express that the same number of cows or their equivalent can be kept during a certain time. A three-year-old ox or cow or 2 yearlings represent a head; three animals of two years old represent a head; a mare and colt represent two head. The young calves with the cows are not counted. This computation is admitted and has the sanction of the law in case of dispute. The area per head upon the mountains of Salers, where the herbage is thick and rich, is 1⅓ acres; another claims it requires 2½ acres and even more per head. The cost of this mountain pasturage is from $6 to $8 per head for the season. In Auvergne, and especially Salers, these mountains are carefully tended, and are watered as well as possible. They spread the cattle droppings and break down the mole-hills, and close a certain portion each year. When required, drainage is employed, and the pasture is never too closely fed. The herdsmen lead the cows to a dry place for rest at night, and these places are changed every few days. Portions of the pasture well-sprinkled and cared for afford great relief to the cows, which are driven two or three times each day.

The cows ascend the mountain on the 25th May; this is fixed and would require a convention to change. Their time of departure depends upon how much food is at the farm; the 1st of October is about the usual time of descent to the farm. Compared with the Flamandes and Normandes cows, which give 2,500 quarts of milk per year, the cow of the Salers is rated as a moderate milker; but this inferiority does not apply to the whole race, for in Auvergne, as in Normandy, and in the north, we find cows which give 3,000 quarts.

The average of the dairies of Auvergne is at 1,500 quarts, or thereabout, per head. This is less than with the two before-mentioned races, but the difference is equally great in the consumption of food. Indeed, in Cantal the annual food of a cow consists of grass in pasture for eight months of the year, and 18 or 20 pounds of hay for the rest of the time, while in Normandy and the north the cows are always gorged to repletion with a variety of food, and at a cost of three times that of the cows of Cantal, so that for the same amount of food the cow of Salers gives a greater return of milk. The milk of the cow of Salers is very rich and well adapted to making cheese.

CANTAL CHEESE.

Cheese-making is general and well managed in the mountains of Auvergne. This cheese is known throughout France as "Cantal cheese." Its manufacture is so simple that I have ventured to insert it.

The milk is curdled by pressure in large vats, without skimming. The curd is then strained through a straining bag of white bolting cloth, kneaded, salted, and pressed. The whey, still containing some particles of butter and cheese, is mixed with milk, which causes the cream to rise. From this butter is churned. The cheesy particles remaining after the churning are utilized for making a common cheese, consumed in the locality. The whey remaining after the last process, not being considered too rich, is given to the hogs. A Salers cow produces from 8 to 12 quarts of milk per day, while an occasional one is found giving 25 quarts. About 11,000,000 pounds of cheese are annually made in this region, an average of about 410 pounds per cow. The best dairies turn out 440 pounds per head, inferior ones 220 pounds. In the spring it requires 1,000 to 1,100 quarts of milk for 100 kilograms (220 pounds, of cheese, but as the season advances the richness of the milk in cheese increases. In the fall it again requires 600 quarts of milk for 100 kilograms (220 pounds) of cheese. An average for the year would be about the latter figure. This same milk produces besides from 15½ to 18 pounds of butter. This cheese is sold to the merchants at about 10 cents per pound. This price corresponds to about 6¼ cents per quart for milk. In Normandy and the north the milk of which the butter is made gives only a return of about 4 cents per quart.

This difference of price probably indicates the difference in the quality of the milk of the two breeds. This cheese is mostly consumed in Limousin and the south of France, and, though not sought for by the epicures, is palatable and nourishing. It is claimed that the "race de Salers" is less important in a dairy point of view than in furnishing working cattle and food.

THE SALERS CROSS-BREEDS.

The cross-breeding has been tried with the English races of Durham, Devon, the Scotch breed of West Highland, and the Swiss races. The animals of the cross-breed of the Durham at the late exhibition at Paris indicated a slightly greater precocity, but the general verdict of those who have carefully examined the subject is that the crossing has not ameliorated the race, and that this can only be effected by a careful selection of breeding animals taken from the admirable race itself.

RACE D'AUBRAC.

Although I have not so classified it, it seems proper that the race d'Aubrac, having the fixed characteristics of a distinct race, and although neighbor to the race de Salers and bearing a resemblance to that race, should not be confounded with it. One of the most marked peculiarities of this breed consists in its short legs, out of proportion to its long, thick body, characteristic, however, of all the animals of this region, not excepting the human race. The race d'Aubrac has a good head, fair size, the snout long and large, strong horns, gracefully turned and twisted and of moderate length.

The d'Aubrac cow has a handsome velvety coat and flexible skin, the chest large, the back flat, the bones of the haunches rounded and slightly prominent. The color of the coat is rarely simple, but mixed with clouded tints. The ordinary colors are fawn, hare tint or badger, and soot black, mixed with black and gray.

The ox of this breed attains its growth very slowly. This is not surprising, considering how those animals intended exclusively for work are brought up. But this want of precocity does not apply to all of the race, since some magnificent Aubrac cattle evince remarkable precocity. To obtain this condition the animal must be well fed from the time that it is weaned.

DAIRYING IN AVEYRON.

The cow of Aubrac, like those of most of the southern breeds, is smaller than the male. It is not a great milker, under favorable circumstances giving but 9 or 10 quarts of milk per day. The cheese-making is nevertheless extensively carried on in these mountainous regions. The cheese is deemed superior to that of Holland, but will not keep so long, as the whey is more carefully removed from the latter.

The same establishment of mountain dairies as found in Salers exists in Aveyron. Each dairy of one hundred cows has a head of the cheese-house, to whom $24 is paid; a boy especially in charge of the calves, at half price; three herdsmen, at $16 each, which makes a total of $84 wages for a herd of one hundred cows. The wages are paid at the end of the season, out of the product. These employés are fed on milk, rye bread, and salt bacon; this food is estimated at $28. The capital of an establishment of this kind is about $200, besides shifting fences for inclosing the cattle at night, and dairy utensils and cheese on hand, which never exceed $100. The average yield of an Aubrac cow is 140 pounds cheese and 7 pounds butter.

THE AUBRAC MEAT-OX.

The butcher's stall is the end of the ox of Aubrac, as of all the rest of the oxen in the world, but as a working animal he gives a good profit for his keeping, and it therefore does not detract from his value that he attains his growth slowly.

THE AUBRAC CROSS-BREEDS.

With this race, as with that of the Salers, the crossing with other breeds has not improved it, except in regard to precocity, and as the animal more than pays his way, it seems no object to obtain this precocity at the expense of diminishing his usefulness as a worker.

THE GARONNE BREED.

The race Agenaise, or Garonnaise, is found in the valley of the Garonne, between Toulouse and Bordeaux, an extent of about 60 leagues. This is one of the finest, largest, and strongest breeds of France, and well adapted to the portion of the country which it occupies.

CHARACTERISTICS OF THE GARONNAISE.

The oxen of this breed measure 5 feet 8 inches at the withers, and even more, and weigh 2,300 pounds, while the cows only measure 4 feet 8 inches and weigh 770 pounds. This race is not faultless, being considered as having the brisket contracted behind the shoulders, the horns long and pointed towards the ground, and the back hollow. This latter is, however, partially overcome in some animals.

FEEDING IN THE GARONNE.

The animals of the high land are fed with a certain parsimony, while a model style of food is provided for those in the valleys. A constant succession of artificial forage, fresh and green, is afforded from 15th March to the 15th of November. From the 15th of March to the 15th of April green rye is fed and mixed with cut straw. This grain, sown in October on a well manured soil, furnishes at the end of winter a nourishing and healthy food. From the 15th of April to the 1st of May, before the blossoming, barley sown in November and later is fed. From the 1st of May to the 15th of June these grasses are replaced by dry fodder; red clover, green and dry, constitutes a portion of their food.

From the 15th of August, for the clover, a mixture of vetches and oats, sown at intervals, affords refreshing nourishment during the extremely heated season. Towards the middle of August the corn fodder is ready and lasts till the middle of November. The corn is sown in the spring upon the same ground from which the rye and barley had been cut in the spring. Eleven-fortieths of an acre sown in corn will support two cows for two months. This crop is valued at $3 to $3.50. The leaves and seeds of millet are utilized. These are carefully gathered, and if the other fodder is sufficient, are not drawn upon till winter. During the four months of winter the main dependence is upon red clover, the Holland clover straw, and hay; but few roots are cultivated in this part of France for fodder.

THE GARONNAIS OX.

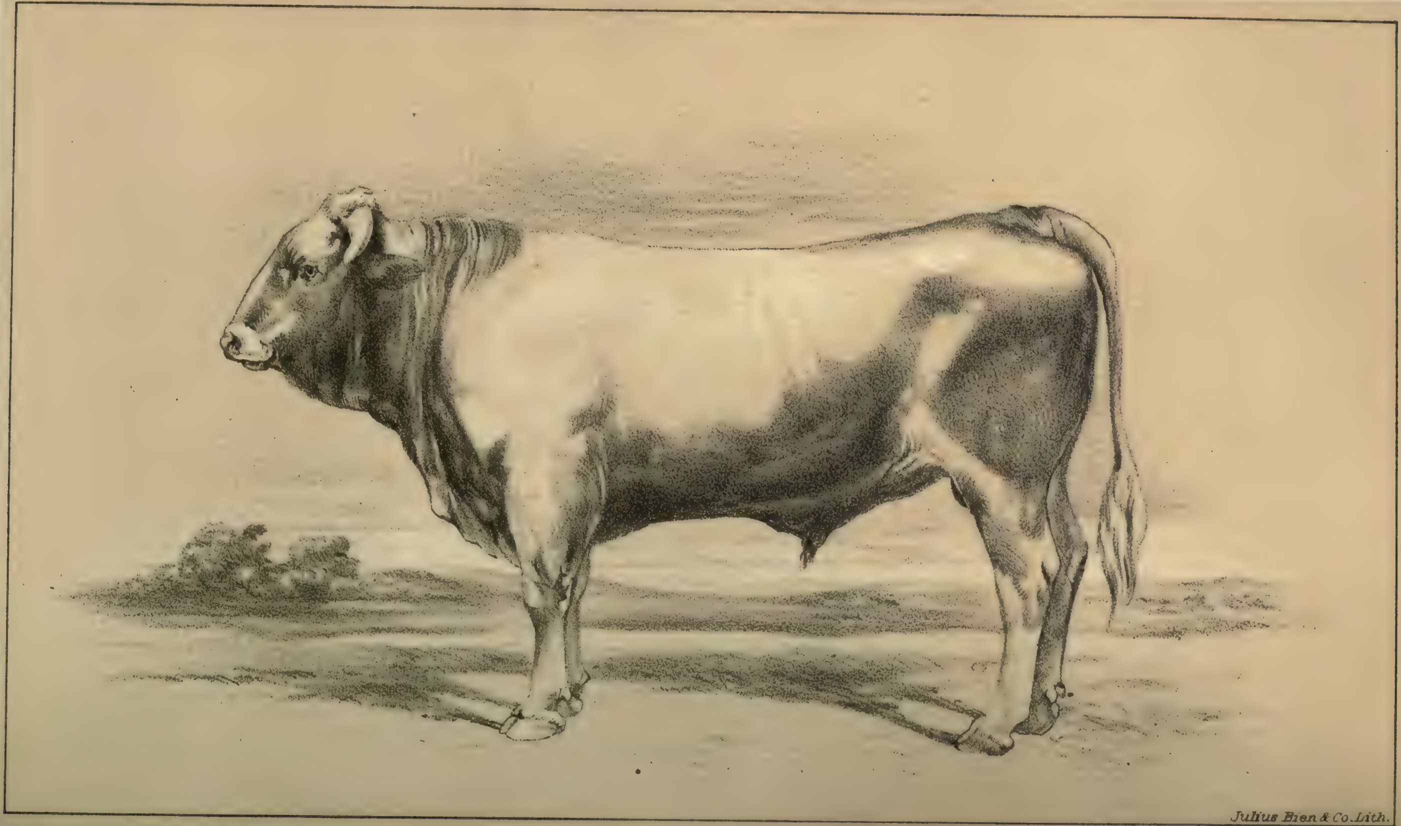
The Garonnais ox, of large and solid build, is not only used before the carts of the country, but can be seen at Bordeaux slowly trailing heavily laden carts for the loading and discharge of vessels.

In the way of fattening and early maturity the ox merits attention. At the recent Paris exhibition many could be seen which were precocious and of good size, giving good returns of meat in regard to quality and quantity.

THE GARONNAIS CROSS-BREEDS.

A single cross-breed Garonnais, being Limousin-Garonnais, was exhibited and appeared well. There appears no good reason why these races, both remarkable for working and meat, should not assimilate readily. The best accredited opinion is that the Durham race is descended

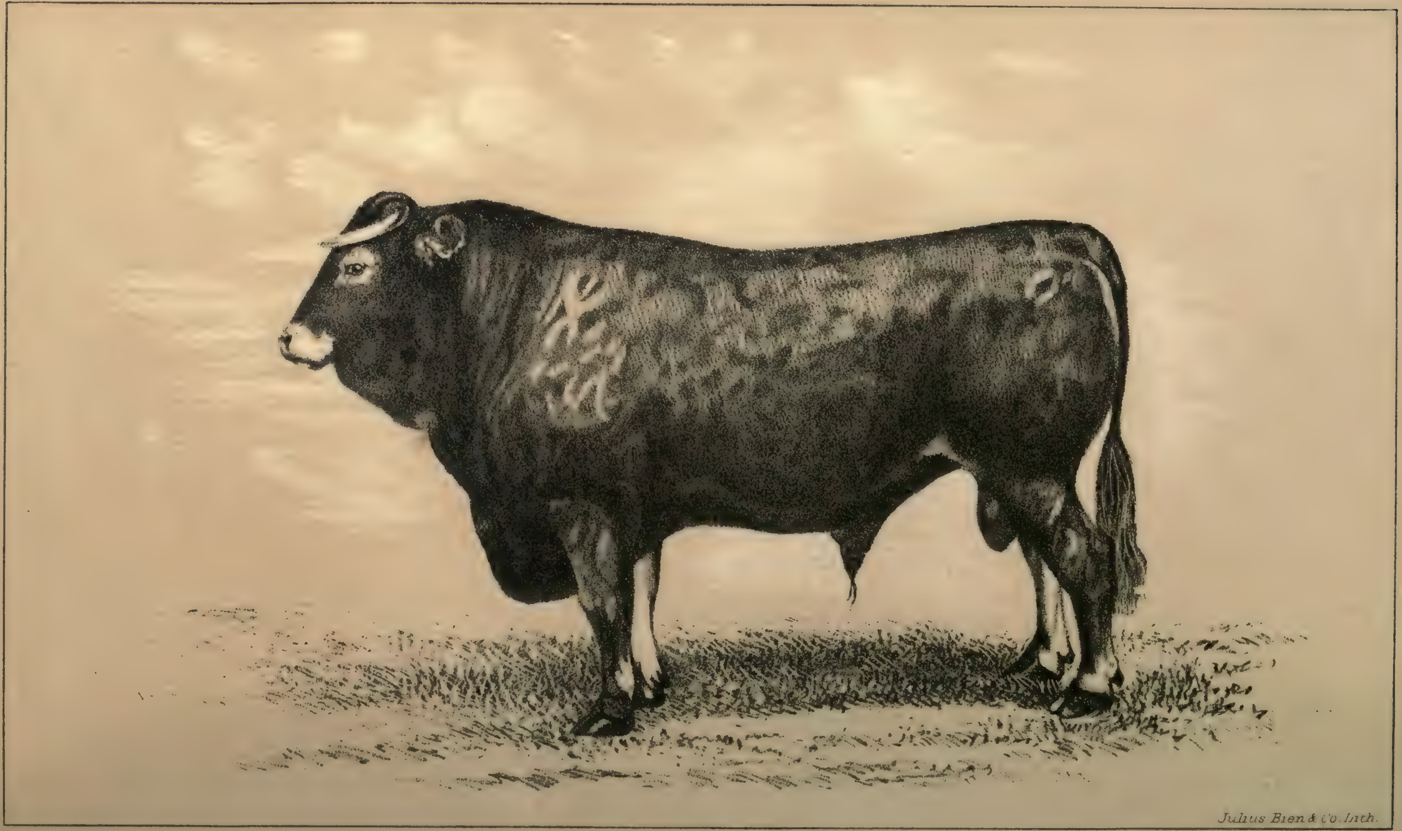
PLATE 106



Julius Bien & Co. Lith.

GERRONNAIS BULL

PLATE 107


Julius Bien & Co. Lith.

BAZADAISE BULL

from the Holland breed, but some claim is made that it came from the race Garonnaise, a large number of which were exported to England. However this may be, there is some foundation in the precocity of the race, which does not equal that of the Durham; but the aim is attended with success to improve this race, and, like the Charolais, Garonnais, and the Durham-Manceaux, to rival the Durham in returns of meat, without impairing their working capacity.

CENSUS OF THE GARONNAIS.

The number of this breed occupying the vast and fertile valley of the Garonne is about 400,000 head, spread over 4,200,000 acres of land. The number of these animals is increasing and their condition sensibly improved from year to year.

THE BAZADAISE BREED.

On approaching the railway station at Laugon, between Bordeaux and Bayonne, we invariably see in the summer small clumsy carts, with low wheels, laden with pine wood, and drawn by animals which we recognize with difficulty, on account of their droll trappings, as oxen.

The head, quite large, appears larger in consequence of a species of head-gear made of sheep-skin, which entirely protects it and shades it from the sun in that warm latitude. A sort of shirt of coarse cloth covers closely and protects the animal against the bites of flies and other insects. This curious clothing and intelligent care evince the proper and just appreciation of the inhabitants of the Landes toward the beasts which serve and feed them. There is no occasion there for a society for the protection of animals.

This race derives its name from that of the charming little city of Bazas, in the extremity of the department of the Gironde. The soil about Bazas is more fertile than that in the districts of Mont-de-Marsau and Dux, which explains the difference between the two neighboring races, the race Bazadaise and the race Landaise, although these races have many points of resemblance. The oxen are often submitted to long journeys over paved roads, attached to heavy carts. They toil along these dusty roads under a burning sun, and bear up well under it. The ox-driver takes the best possible care of his cattle, and never strikes them. They march along at their ease; he excites them by words, speeches, and even pleasantries, and a particular song, on hearing which the ox redoubles his efforts.

Farmers and butchers at Bordeaux and Paris are unanimous in their praises of this breed. The superiority of the flesh of the Limousins and Salers is attributable to the fact that these breeds are usually worked very lightly, or about enough to pay for their feed, while the Bazadais does not only agricultural but commercial work. At the south the cows are worked more than the oxen by the farmers. The horse of the Landes is small, light, delicate, excitable, fiery, indefatigable in running about the country, but incapable of working the land or carrying heavy loads. Breton or Boulonnais horses, if substituted, accustomed to good, rich food, would be expensive. Oxen are more convenient, economical, and therefore in general use. The ox, however, fattens easily, and gives a good return of 60 per cent. or more.

There have been few attempts to cross this race, while great strides have been made in their amelioration by selection.

THE LANDAISE BREED.

I have said that the race Bazadaise is often confounded with the race Landaise. It is often crossed thus, but without any advantage, and tending to attenuate the proportions of the animal. The race Landaise, like the Bazadaise, is found in the department of the Landes, and is also subjected to hard work. Agriculture is rude in that department. The animals subsist upon scanty, hard grass. During the winter the working cattle are fed upon hay, the others upon wheat, straw, and corn-stalks. On many farms the cattle are fed by hand. Many wickets are placed in the wall of the house which opens upon the court, surrounded by sheds and stalls, where the animal is free. By these wickets the members of the family in turn give mouthful after mouthful of food to the animals, and with wonderful patience and economy place every mouthful of food in the very gullet of the animal, thus prevented from rejecting it. They are often tempted by the sight of a green leaf, or some appetizing hay tea, or a bit of turnip, but these appearances are often deceitful, and the poor beast is only offered some dry straw which had been untouched in his rack and should have served for a bed.

This method of taking care of an animal takes much time, and makes a great inroad into the night of the workman, whose entire day is taken up in the fields; but it is astonishing with how little feed, of the most ordinary kind, the animals subjected to heavy and incessant labor can be kept in good condition.

The cows, much smaller than the oxen, are subjected to hard work, while they nourish their calves without receiving any additional nourishment themselves.

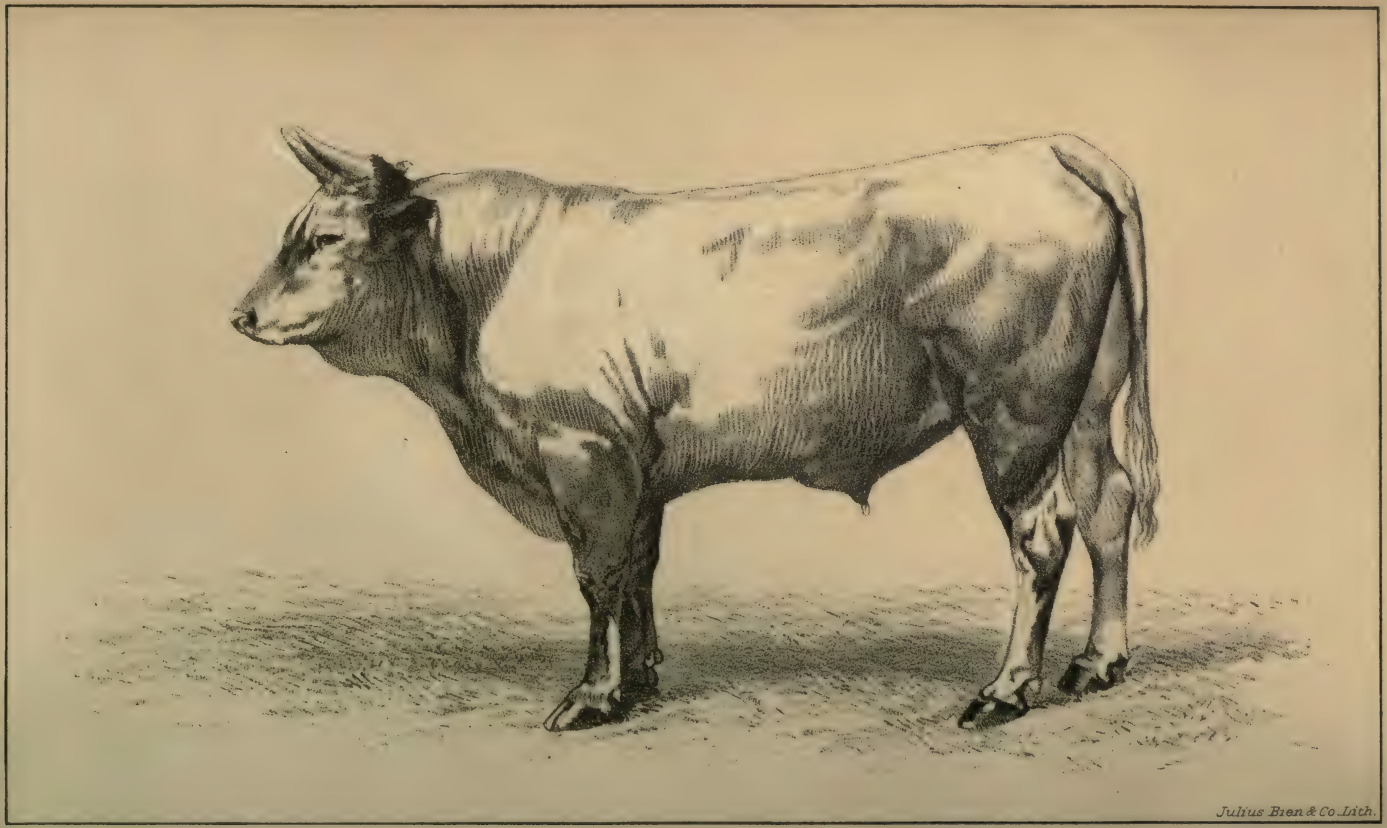
LANDAISE BULL-RACES.

The agility of these animals is extraordinary; they take a trot without being blown. They are often sent on long routes and make 45 to 50 miles in twenty-four hours, and in making these distances they do not stop for rest. At the fairs in the Landes the agility of these animals is often exhibited; the bulls rarely figure in these games, although they are termed "bull-races." The oxen and cows ordinarily take part in these games. These are less exciting than bull-fights, but the greatest enthusiasm is evinced by the crowd, and the same agility and audacity on the part of the actors, who evince a curious knowledge of the ways of the animal, to whom they openly oppose themselves without any other defense than the rapidity of getting out of his way. The skillful athlete, with a cigarette in his mouth, makes a slight movement when the bull advances towards him with his head lowered; the horns graze his breast, but he has closely calculated the distance. As the infuriated animal rushes upon him, with his head lowered to strike him, he coolly places a foot between his horns, and, aided by the upward movement of the animal's head, safely springs behind him. This is not always accomplished without accident, but precaution in the way of cords usually prevent any unpleasant episodes.

THE LANDAISE AS A MEAT CATTLE.

The race Landaise has an established reputation at the annual fairs of fat cattle in France. Upon a hardy race, badly fed in its home, as are the Landais, increased food works wonders; if to this is added a selection of breeding animals you are sure to arrive at the utmost relative perfection of the race. This race, while strongly framed for work,

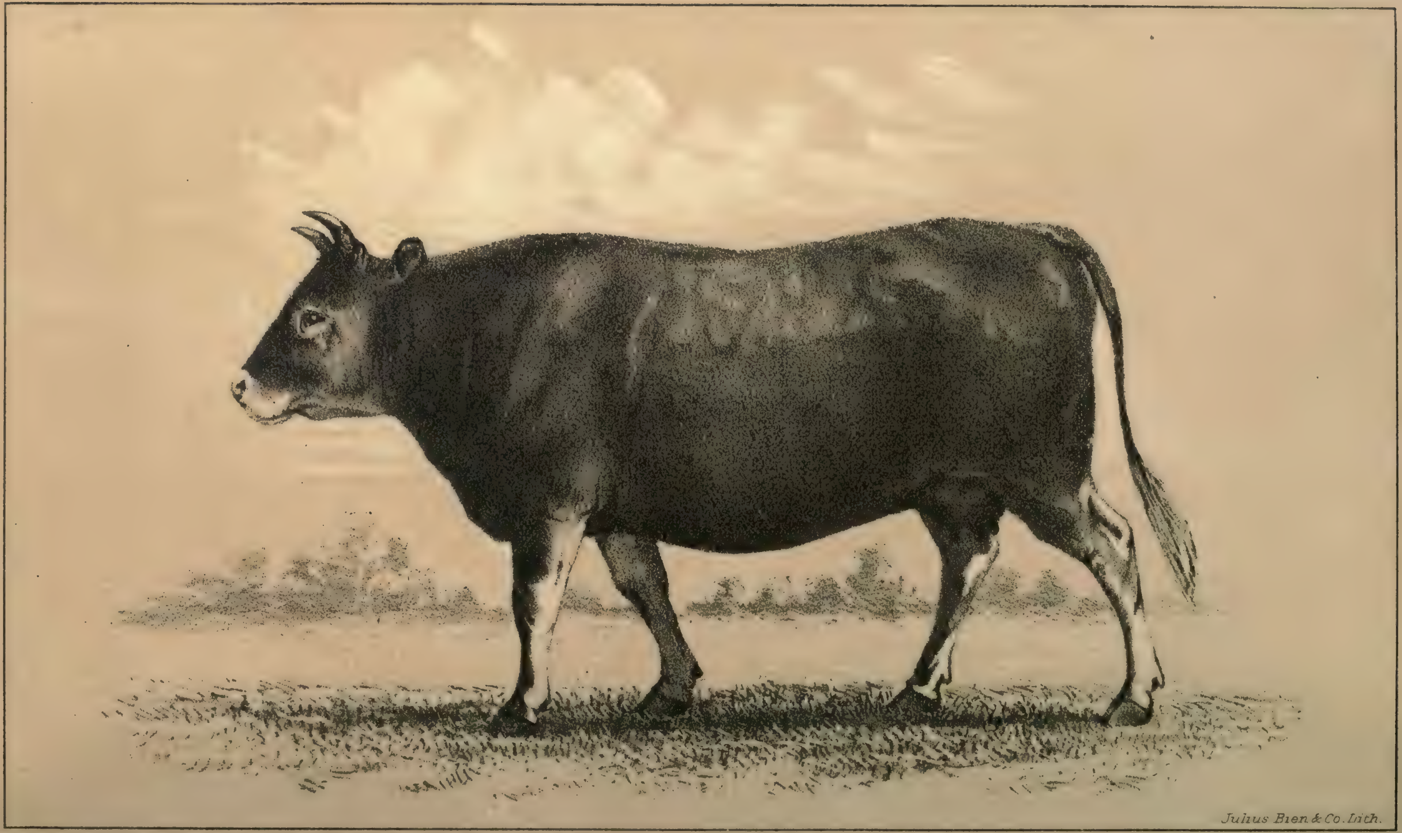
PLATE 108



Julius Bien & Co. Lith.

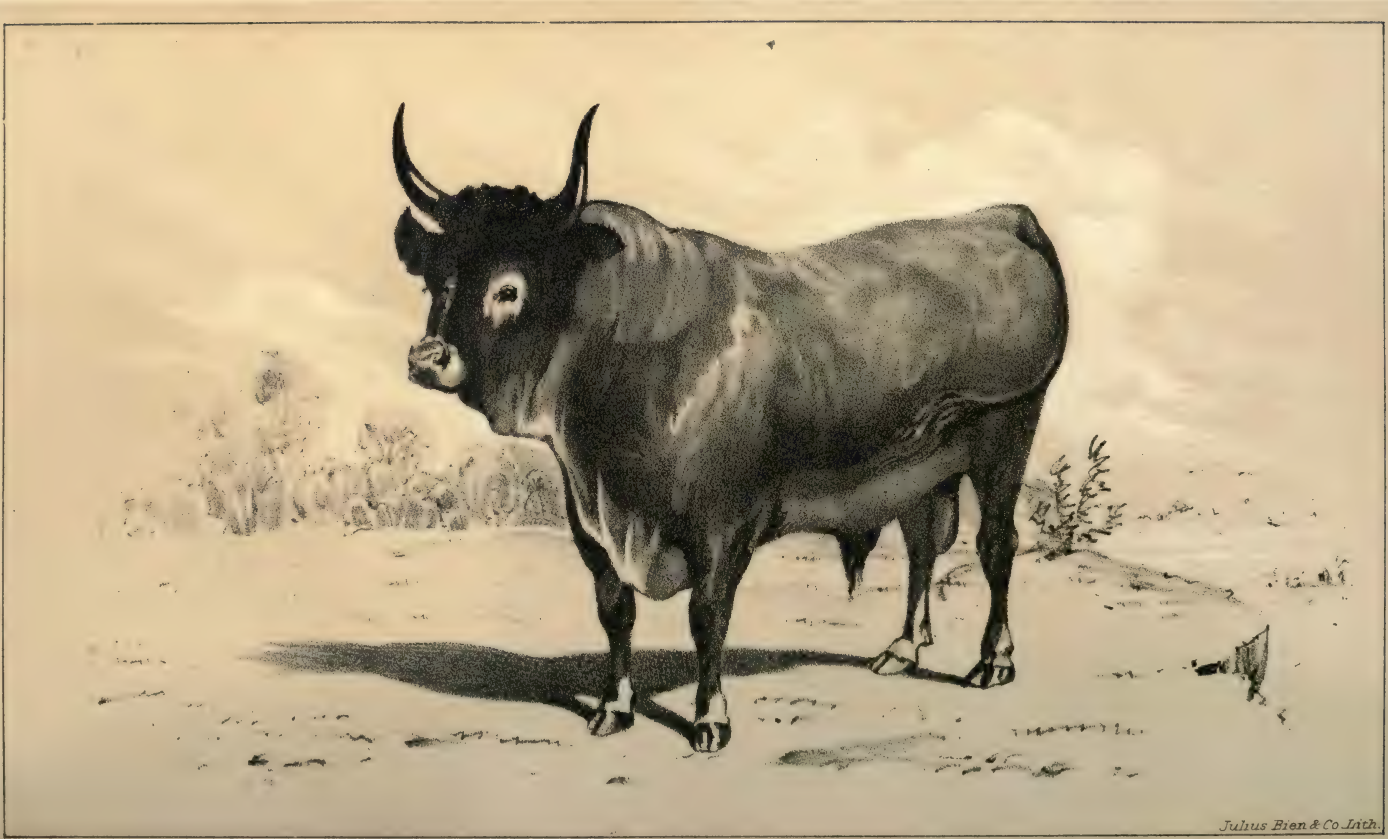
LANDAISE BULL

PLATE 112


Julius Bien & Co. Lith.

ALGERIAN COW

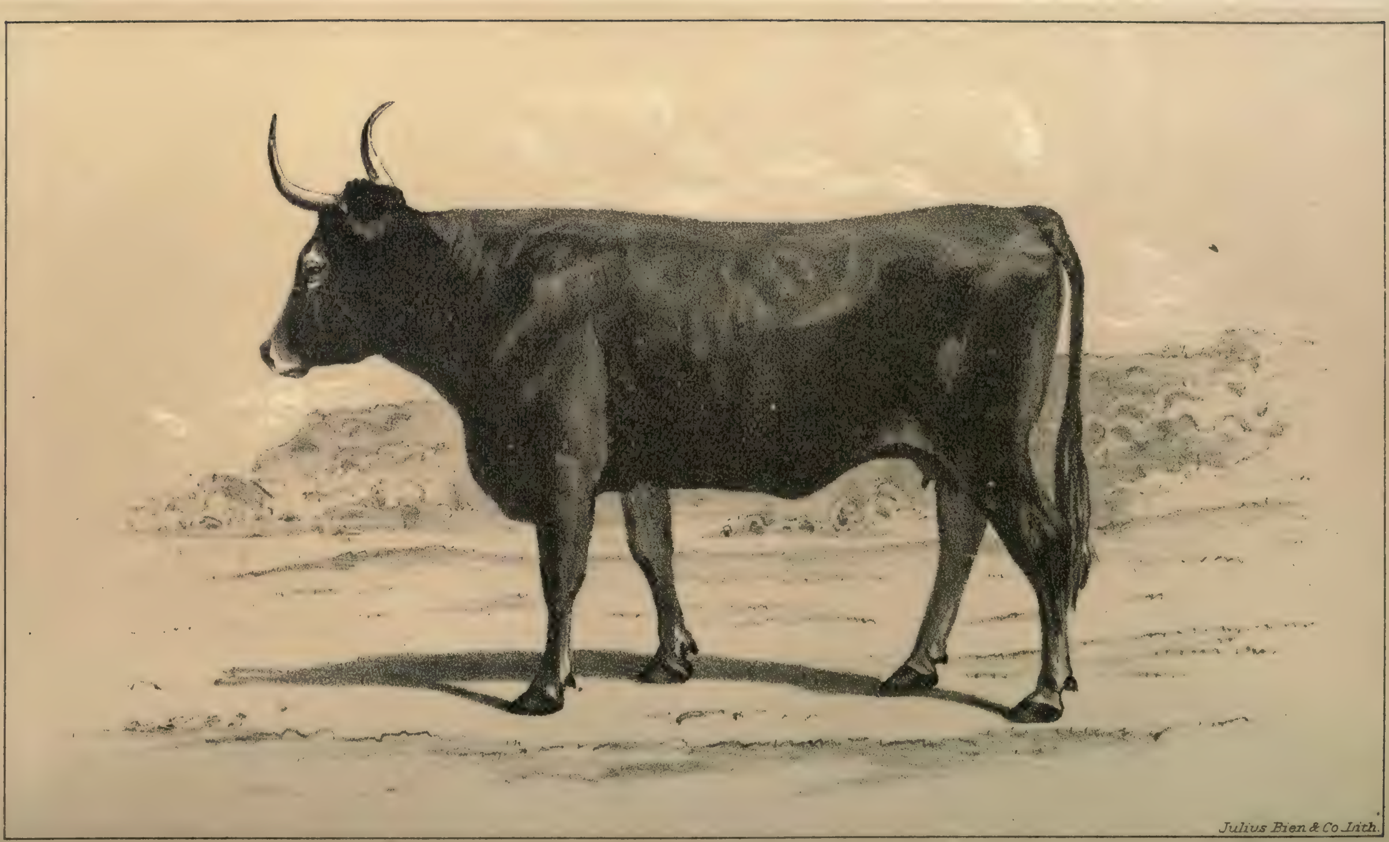
PLATE III



Julius Bien & Co. Lith.

BARETONNE BULL

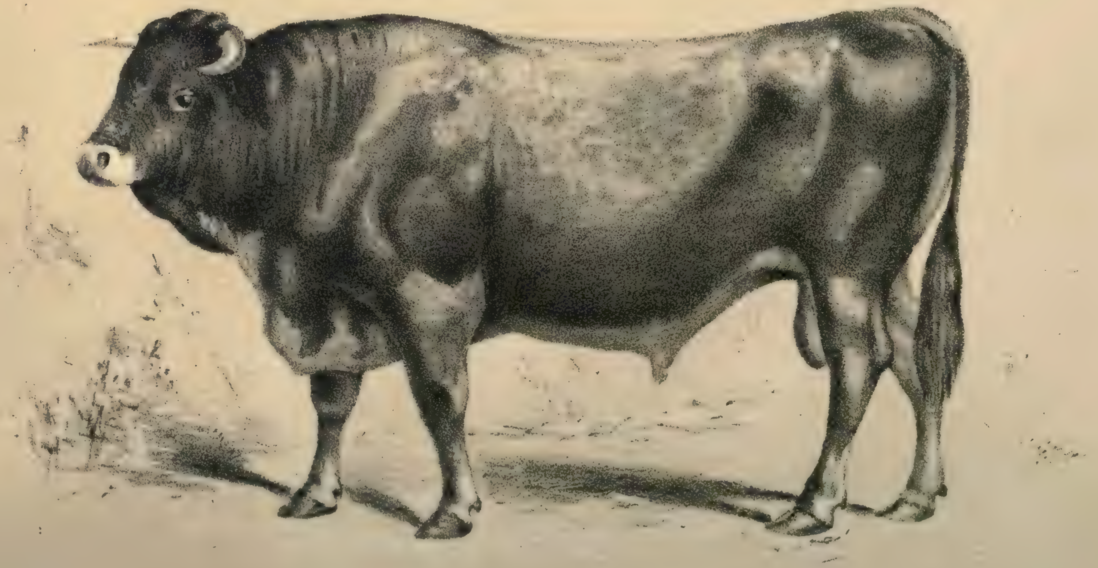
PLATE 110



Julius Bien & Co Lith.

BEARNAISE COW

PLATE 109



Julius Bien & Co. Lith.

GASCON BULL

has a small, bony structure, qualifying it for taking flesh. This peculiar bony structure belongs to the race therefore it has been demonstrated; that if these animals are well fed from their birth, they will at an early age return good profit for their keeping for the sole purpose of food.

THE GASCON BREED.

All agree that the race Gasconne is especially adapted to work. Its prominent features are briskness and force for work. It is principally found in the department of Gers, a very broken country, where the cultivation of the hills is difficult and laborious. Its powers are here put to constant proof. Its faults are those of a race given up to work entirely, and that of the hardest kind. The oxen are worked until they are twelve to fifteen years old, and then fitted as well as may be for the butcher.

Compared with the races Bazadaise and Garonnaise it has many traits in common. The race Gasconne is slower and more clumsy, but more vigorous, stiff at work, like the soil it cultivates. The Garonnaise is more precocious. The race Bazadaise is more lively, better adapted to the light soil that it dwells upon, and above all to the fatigue of long journeys, which it bears astonishingly. The cows of this breed are more in number than the oxen and are submitted to very rough work. They are poor milkers, scarcely affording nourishment for their calves.

In that part of France they cook with oil and fat, and there is little demand for butter. Those who wish for milk buy the little Bretonnes which are found in great numbers in the Pyrénées, and from Bordeaux to the eastern limits of the Biscayan country.

There are numerous subraces, considered distinct, notedly those coming under the head of Ariégé, but they would scarcely interest those studying the French races from an American point of view.

CATTLE OF THE PYRÉNÉES.

Although it is admitted that there are many varieties, known as "Basquaise," "Barétone," "Landaise," they resemble one another so closely that it would simplify matters much to generalize them as "races des Pyrénées" or races of the Pyrénées. Like all the mountain races, these increase in size when taken to fertile plains. They are not very great milkers, but there are found exceptional cows which give a fair average, but they are more or less uniformly good workers, and can be fattened fairly after their days for labor are over.

ALGERIAN CATTLE.

The race of Algiers is not very generally known, but as stock-raisers send yearly a large number of cattle to Marseilles, as well as the interior of France, a brief sketch of this race might not be out of place.

The coat is generally brown or mauve, sometimes drab or chestnut, more or less mottled, seldom clear. Its girth varies from 3 feet 9 inches to 4 feet 5 inches. The smaller animals are found in the mountains, the larger in the richer valleys.

Characteristics.—Frame rather large than small; head wants fineness, without being exactly heavy and large; limbs large and firmly attached; horns large and colored, their direction upwards and circular; body short, thick and round; withers thick; sides well arched; chest fair size; dewlap prominent; flank short; skin smooth, but rather thick than fine; step light and aspect lively; very tractable and of good disposition. On the whole, this description pictures an animal without many faults. The ox is a good worker, tough, energetic, and only needs size and weight.

Care and handling.—It is said of them that they live and thrive where European breeds would languish and die, submitted to the same fare.

In the spring they have abundant feed, but during the rest of the year they live upon dry herbage, sunburnt or injured by the heavy dust, while for drink they only have an insufficient quantity of brackish water. Such is the carelessness of the Arabs that they fail to provide forage for the winter, although the snow sometimes covers the earth for fifteen consecutive days. They do not attempt to protect the cattle from the cold of winter or from the excessive heat of summer, and the cattle, submitted to all the vicissitudes of a variable climate like that of Algiers, endure a deprivation of food more or less complete for nine months of the year. It is not astonishing, therefore, that the mortality of these cattle is great.

The Algerian cow as a milker.—The Algerian cow is a poor milker; gives scarcely milk enough to nourish her calf, which the Arab woman tries to take from her for the household. Only one of the four teats is allowed for the calf. If this cow is a poor milker, as an offset its milk is rich. The Arabs drink it fresh or sour, and make butter and cheese by a barbarous process, a description of which would not be instructive. This race has been crossed with the Schwitz, a native of the center of Switzerland, with happy results, adding to the size and improving the milking qualities. Submitted to a good liberal regimen they have excited attention and admiration, and have yielded as high as 69 per cent. net meat. In 1878 42,250 Algerian cattle were imported into France.

MISCELLANEOUS BREEDS.

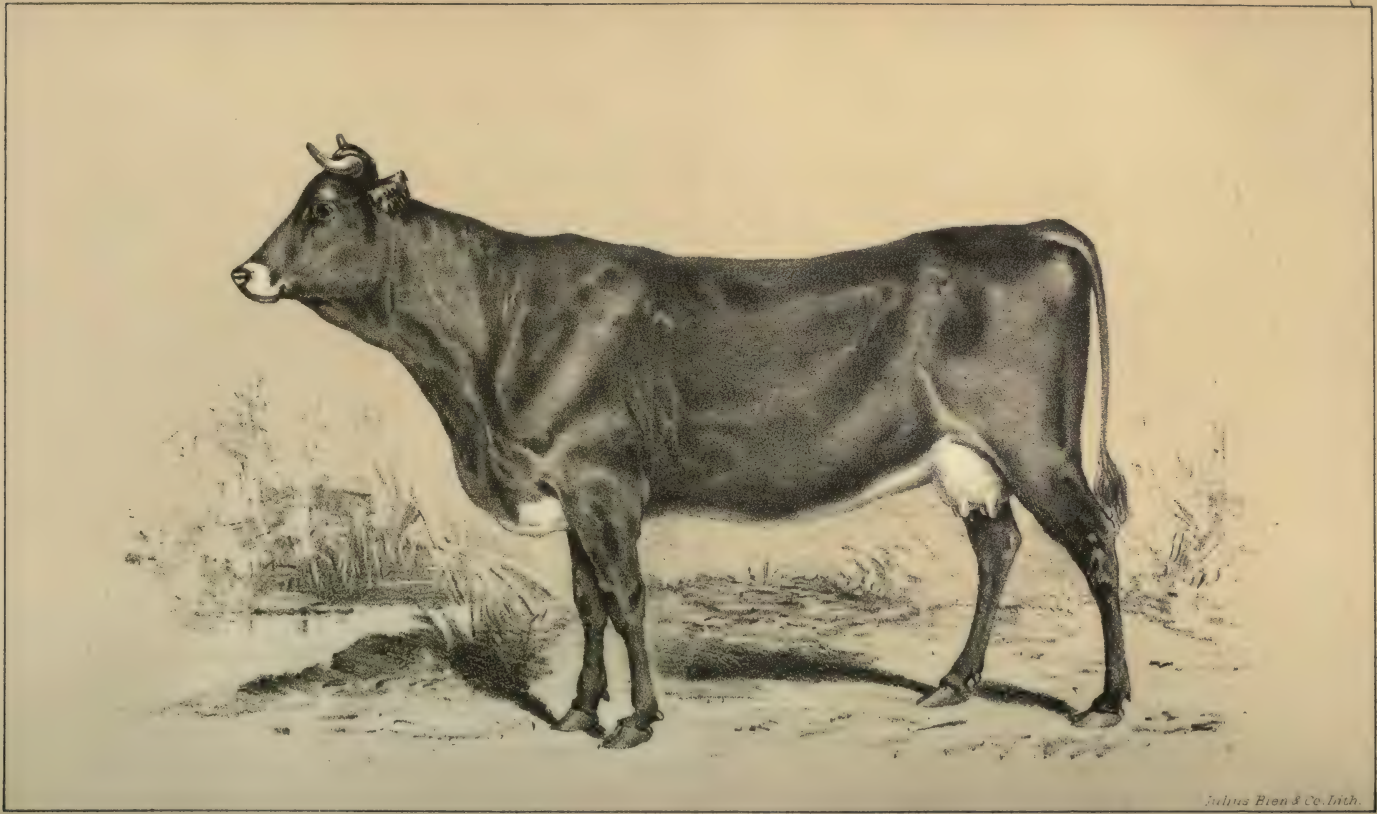
This article might be extended to an indefinite length if attempt were made to include many of other breeds and subbreeds, such as the race Tarentaise; the breed of the Black Mountain, termed "race de la Montagne noir;" the race du Gevaudau, found in the department of Herault, of small size, but said to be as old as poverty. I have endeavored to call attention to the more prominent breeds of cattle as seen in their homes, and describing their surroundings, solely in the hope of guiding the intelligent breeder in his search for the type of cattle best adapted to the locality and the ends which he proposes to accomplish by importing the same.

STATISTICS OF LA VILETTE, THE PARIS ABATTOIR.

All of the large cities of France are supplied with abattoirs, or slaughter-houses. The celebrated La Vilette, of Paris, combines the advantages of a cattle market with a slaughter-house; has ample accommodations for housing 5,000 or 6,000 head of cattle, besides calves and sheep. About 5,000 head of oxen are slaughtered here weekly, in addition to the other animals. Upwards of 1,000 men are employed here, and the streets are paved.

There are 64 large buildings, some for the doomed cattle and others used as slaughter-houses. Fountains and tanks abound. These buildings cover about 67 acres, and the whole presents the appearance of a

PLATE 113



Julius Bien & Co. Lith.

GEVAUDAN COW

miniature city. The details of the entire process, from the time that the animal arrives in Paris until the product of meat reaches the consumer and the remainder is utilized, although an interesting and profitable study, scarcely comes within the scope of this article; but I will give, as calculated at Vilette, "the returns of the products of an ox of the average weight of 350 kilograms (770 pounds) and of average quality:

Returns of products.

	Francs.
Hide, average weight 48 kilograms, at 1 franc	48.00
Suet, 25 kilograms, at 92 centimes	23.00
Refuse	18.00
Total	89.00

Expenses.

Octroi, at 12 francs per 100 kilograms	42.00
Bringing from the market to the abattoir	.35
Washing of the tripes	.40
Labor	6.00
Sundry expenses (food, material, &c.)	5.00
Total	53.75
Balance	35.25

Or about 10 francs per 100 kilograms.

This proves that an ox bought in the market for 1.60 francs per kilogram (per pound about 14 cents) costs in the abattoir 1.50 francs per kilogram (per pound about 13 cents).

The variation in the prices of hides and suet may more or less influence the price of the net meat, but the above figures demonstrate in an exact and general way the returns of the products and the cost of the labor and management.

The return of net meat of the animals slaughtered in Paris varies according to the age, the race, the kind of food, and the degree of fatness they have reached.

The returns at Paris are greater, as the journey rids the intestines of excrement.

The net returns from cattle from 3 to 5 years old is found to be proportionally the best. The average return is, for cattle in ordinary condition, from 50 to 55 per cent.; half fattened, 55 to 60 per cent.; fattened, 60 to 65 per cent.; extra fattened, 65 to 70 per cent.

Animals slaughtered in the abattoir général at Paris.

Year.	Oxen.	Calves.	Lambs.	Total.	Year.	Oxen.	Calves.	Lambs.	Total.
1873	161,862	129,698	1,030.615	1,322,175	1878	189,499	183,798	1,431,537	1,786,834
1874	166,579	138,360	1,140,530	1,445,469	1879	198,573	183,777	1,409,129	1,791,479
1875	189.333	162,379	1,238,482	1,590,194	1880	218,080	186,913	1,531,462	1,936,455
1876	194,565	168,943	1,277,726	1,641,234	1881	232,621	192,781	1,573,563	1,998,965
1877	183,190	177,460	1,280,430	1,641,080	1882	239,204	198,473	1,603,123	2,040,780

The above figures, from an authentic source, give an idea of the immense work done in this vast establishment.

The number of animals slaughtered in the abattoirs of Grenelle and Villejuif during the year 1882 was: Oxen, 34,178; calves, 31,970; lambs, 203,843.

This gives the following total of animals slaughtered in Paris in 1882: Oxen, 273,382; calves, 230,443; lambs, 1,806,966.

OCTROI TAXES.

The octroi, or municipal tax, is levied in all cities and villages upon every article of food and drink. Every person who eats and drinks thus becomes a tax-payer.

GRADING MEAT IN LILLE, PARIS, AND LONDON.

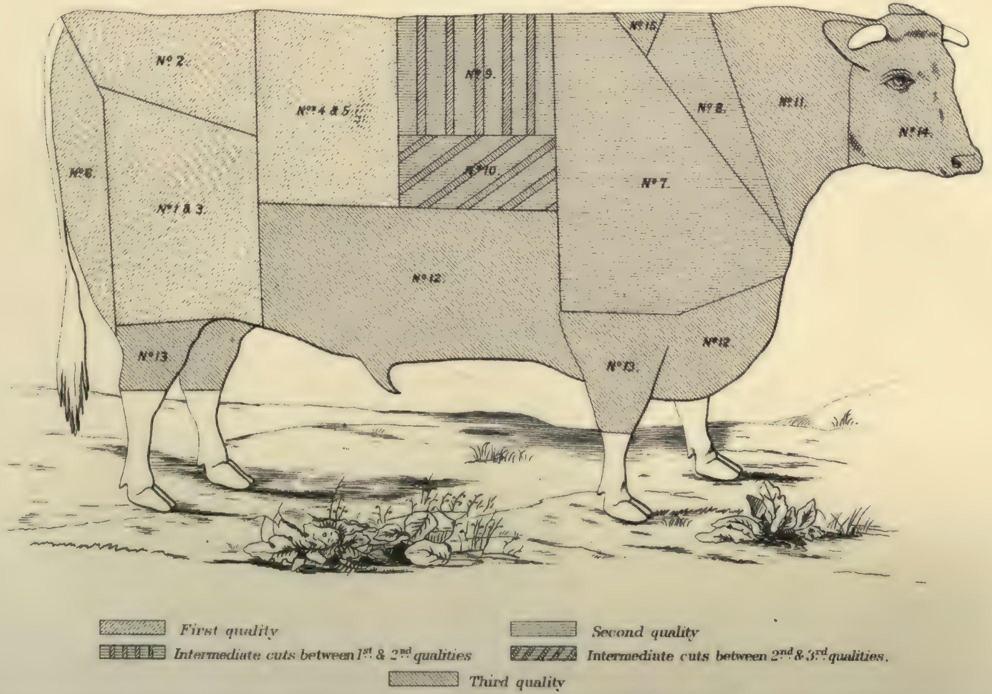
The different appreciation of the various cuts of meat in the markets of Lille, Paris, and London is astonishing. The stock-breeders are interested and should familiarize themselves with this question, that they may know what portions of the body they should strive to develop by the judicious choice of breeding animals. In the same animal the market price varies more than half, according to the part of the animal from which it is taken. A pound of the fillet in the subjoined cut, No. 1, fig. 2, and No. 5, fig. 1, are sold at Lille at 41 cents and at Paris at 44 cents per pound, while the portions 13, 14, and 15 scarcely bring 12½ to 14 cents per pound. This distinction is not made in all the cities, but is destined to become general in all large centers of consumption.

The accompanying cuts and tables give a clear idea of the mode of grading beef in Lille, Paris, and London:

Mode of dividing an ox in the abattoirs at Paris.

Quality.	Number of pieces.	Names of pieces.	Weight of each piece of a fat Norman ox, weighing 457 kilograms net (1,007.50 pounds).
			Pounds.
I	1	Veiny piece	44.09
	2	Ditch bone	66.14
	3	Thick flank	44.09
	4	Sirloin	110.23
	5	Fillet	15.43
	6	Buttock	33.07
		Total of first quality	313.05
II	7	Shoulder-blades	154.32
	8	End of neck	11.02
	9	Ribs	99.20
		Total of second quality	264.54
III	10	Chuck	55.12
	11	Neck	77.16
	12	Brisket	165.34
	13	Leg and shin	55.11
	14	Cheek	22.04
	15	Inner sirloin	22.04
	.	Kidneys	33.10
		Total of third quality	429.91
		Total of the three qualities	1,007.50

FIG 1.

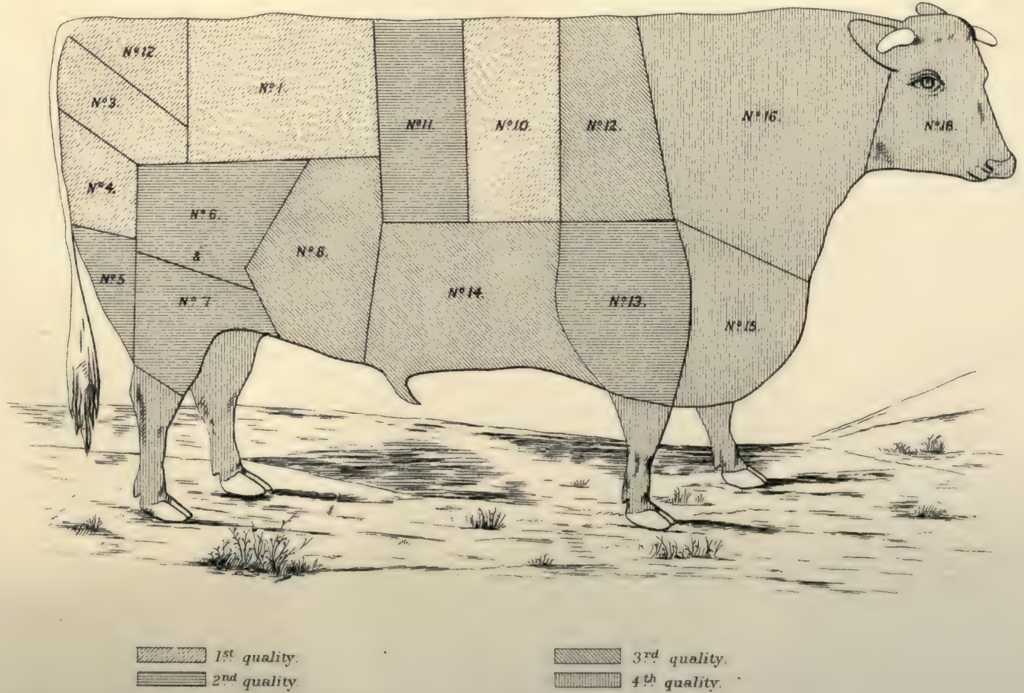


Julius Bien & Co. Lith.

HOW THE PARIS BUTCHERS CUT UP A BEEF.

PLATE 116

FIG. 3.

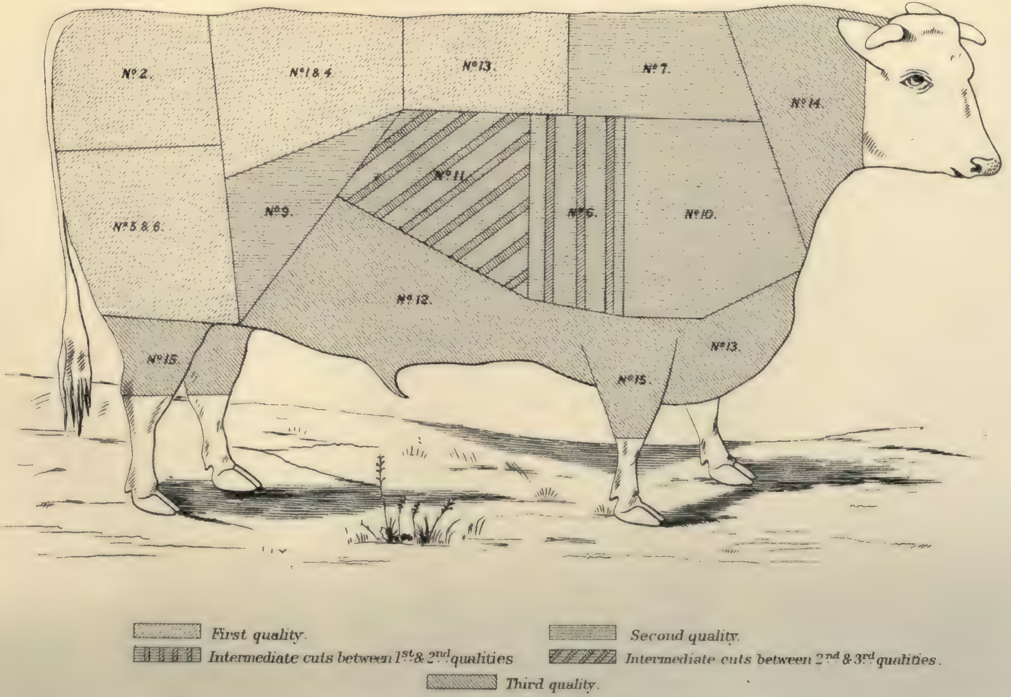


Julius Bien & Co. Lith.

HOW THE LONDON BUTCHERS CUT UP A BEEF.

PLATE 115

FIG. 2.



Julius Bien & Co. Lith.

HOW THE LISLE BUTCHERS CUT UP A BEEF.

Mode of dividing an ox in the abattoirs at Lille.

Quality.	Number of pieces.	Names of pieces.	Weight of each piece of a fat Flamand ox, weighing 458 kilograms net (1,009.70 pounds).
			Pounds.
I	1	Fillet	15.00
	2	Rump	70.54
	3	Ribs	77.16
	4	Sirloin	61.72
	5	Veiny piece	35.27
	6	Thick flank	57.32
		Total of first quality	317.01
II	7	Blind ribs sirloin	92.60
	8	Mouse buttock	59.52
	9	Piece called "l'ij"	48.50
		Total of second quality	200.62
III	10	Shoulder	97.00
	11	Chuck	66.13
	12	Flank	68.34
	13	Brisket	92.60
	14	Neck	52.91
	15	Leg and shin, &c	115.09
		Total of third quality	492.07
		Total of the three qualities	1,009.70

Mode of dividing an ox in the London butcher-stalls.

Quality.	Number of pieces.	Names of pieces.	Weight of each piece of a 4-years of age, ordinary quality, weighing 1,032 pounds, English weight (467 kilograms).
			Pounds.
I	1	Sirloin	144
	2	Rump	72
	3	Ditch-bone	32
	4	Buttock	112
	10	Fore ribs	112
		Total of first quality	472
II	6 7	Veiny piece, and thick flank	56
	5	Mouse buttock	24
	11	Middle ribs	120
	13	Shoulder	48
		Total of second quality	248
III	8	Thin flank	72
	12	Chuck	44
	14	Brisket	64
IV	15	Clod	40
	16	Neck	48
	16	Leg and shin	44
	18	Cheek	....
		Total of third and fourth qualities	312
		Total of the four qualities	1,032

FOOD CONSUMPTION IN FRANCE.

I give below a table of the ordinary annual consumption of food in the principal cities of France, per capita; also a table of the imports and exports of cattle and their products in France for the last three years:

Cities.	Bread.	Wine.	Fresh meat.
	Kilos.	*Liters.*	*Kilos.*
Paris	164	224	80
Lyons	175	230	71
Marseilles	244	186	63
Bordeaux	165	210	65
Lille	219	25	49
Nantes	267	162	46
Toulouse	177	176	55
Rouen	183	49	61

This table demonstrates that the people of Paris consume in average the most wine and the least bread, and those of Lyons the most wine. The inhabitants of Rouen and Lille consume the smallest quantity of wine, owing to the absence of vineyards and the great consumption of cider in the former and of beer in the latter place. The annual consumption of beer in Lille is 213 liters and of cider 124 liters in average.

IMPORT AND EXPORT OF ANIMALS FOR FOOD.

The import and export of animals for food and their products for France during the last three years:

Description.	Import.			Export.		
	1882.	1881.	1880.	1882.	1881.	1880.
Oxen ....head..	77,866	54,133	68,384	39,908	27,531	19,956
Cows ....do....	50,133	44,093	65,431	29,355	30,455	22,259
Fresh meat.....kilograms..	60,285	57,451	75,185	9,182	8,419	5,472
Cheese ....do....	16,056,038	15,638,946	15,790,488	4,430,534	4,076,557	4,267,297
Butter ....do....	6,341,010	7,271,593	7,045,036	38,366,629	30,879,118	31,064,521

MEAT PRICES IN FRANCE.

We have seen that the average price of good marketable beef on foot at Paris is about 32 cents per pound, 28 cents for second class, and 24 cents for third class, while at Rouen the prices are 36 cents, 33 cents, and 30 cents for the same; the latter prices prevail at Lille. There seems no reason why this discrimination should exist to the prejudice of the latter cities, except that no person ever thinks of underselling his neighbor here, and it would be torture to any vender to discover that he had not obtained the highest possible price.

THE FOOD DEFICIT OF FRANCE: WHENCE IMPORTED.

From these tables can be seen that France does not produce its own meat and dairy products, and never can. France is very far from furnishing a good nourishing regimen. The average consumption of meat among the rural population is about 57 pounds per head; in rural districts containing more than 1,000 inhabitants, 147 pounds; and 176 pounds in Paris. In England the average consumption of meat per head is about 180 pounds. This estimate of consumption must be still cut down, for it would require upwards of 6,600,000,000 pounds to furnish this quota, but the actual consumption only reaches 2,600,000,000 to 2,800,000,000 pounds, of which about one-tenth is imported. Italy contributes largely of this amount, in the exceptional year of 1878 furnishing to France 72,661 oxen, 41,775 cows, and 230,000 sheep. Algeria, as noted before, gave 42,250 oxen in that year; Belgium furnished 5,000 oxen and 37,000 cows; Switzerland some hundreds of oxen and thousands of cows and sheep; Germany, besides 1,135,000 sheep, sent some hundreds of oxen and thousands of cows. The United States, up to that time, had sent only 659 oxen. Many American cattle find their way through Belgium into France, owing to greater facilities for shipping by the Belgian lines. In regard to the amount of this traffic the information can be furnished by consuls of French ports in regular steam communication with the United States.

A deficiency of the home supply of meat exists in France, yet the Government has been called upon to play the rôle of Providence and become responsible for unfruitful seasons, and is expected to solve the problem of rendering a high price to the farmer for his meat and grain, while furnishing cheap bread to the laborer. A large number of the more intelligent of the population, influenced in some degree, perhaps, by private interests, consider the public consumption of food as limited and incapable of extension, and that increased exertion is alone necessary to supply the home demand. They therefore conclude that the importation of foreign food is directly hostile to the rights of the French producer, and, relatively, curtails labor.

When they prohibit and restrict the free entry of articles of food, they seem oblivious to the fact that, while they can do little more to increase the supply, the ordinary increase of population demands greater supply, and that in cheapening the necessaries of life they increase the moral and physical vigor of the workman, and enable the poor consumer to apply the difference to other wants. This policy weighs heavily, and inflicts cruel sufferings every day upon the manufacturing districts and affords no relief to the farmer.

CATTLE-FEEDING IN FRANCE.

Stall feeding.—In the north fattening is done largely in cattle-sheds near sugar-houses, or in dairies near towns. The residue of sugar works, distilleries, and breweries, also oil cakes of oleaginous grains, form the principal base of their diet.

Farinaceous food takes but a secondary place and is only used as an accessory. The pulp of the beet-root takes the principal place in the fattening. It is difficult to form any idea of the enormous quantities of food that the sugar works and distilleries of beet-root afford for fattening purposes.

At present France produces 432,000 tons of sugar, for which it requires 7,987,500 tons of beet-root, one-third of which, 2,662,500 tons, pressed pulp of beets after the saccharine matter is extracted, is used for fattening cattle.

Pasture feeding.—It is said that the scarcity of farm labor is circumscribing the limits of this industry. In the description of many of the different breeds mention was made that pastures abounded especially in Normandy, the north, Charolais, Nivernais, Auvergne, Franche

Comté, and Vendée. Those of Normandy can be considered the best for fattening purposes.

Nievre and Charolais rank second. The rental of these pastures varies. In Normandy there are three classes or qualities. The first is valued at $26 per acre; it is estimated that six-tenths of an acre of this land will fatten an ox of 1,200 or 1,300 pounds, live weight. The second-class pastures rent at $21 per acre, which is considered sufficient to fatten an ox of 1,100 pounds, live weight. The third quality rents for $19 per acre, and three-fourths of an acre is considered sufficient for fattening an ox of 900 pounds.

FATTENING CATTLE IN FRANCE.

The graziers of Normandy buy at the cattle fairs of Bretagne, Anjou, Maine, Berry, Manche, Touraine, Poitou, and Santonge, towards the last of April, thin cattle of the Breton, Normand, Parthénais, Salers, Mancelle, and mixed Durham breeds. These cattle are turned into the third-class pastures at first, where they rest and refresh themselves. When improvement in their condition is observed they pass successively into the second and first class pastures. One-fourth are ready for sale in three months, or in the month of August; one-half leave the pastures for the market one month later; the last are sent forward in October. The fattening, therefore, takes about four months. Every fat animal sold is replaced by a thin one. When the feed is too short for cattle, sheep take their place, at the rate of two heads for one of cattle. The pasture is thus occupied from the 1st of May until the 15th of November. Milking cows are pastured the same length of time, and are stabled for the rest of the year, and fed on hay, carrots, cabbages, pulp of beets, or brewers' grains; to this is added, in the neighborhood of Lille, to cows in full milk, a mash of pulverized beans or oil-cake. Carrots, parsnips rich in sugar, beet-root, potatoes, artichokes, turnips, and rutabagas constitute the winter food of the cattle. Very little grain is fed.

COST OF FATTENING CATTLE IN FRANCE AND IN THE UNITED STATES.

The French calculate that it costs $37 per head to fatten cattle in France, and only $2.40 to $2.75 in the United States.

HOW TO PURCHASE CATTLE IN FRANCE.

The requirements and deficiencies of this market in regard to meat are evident. A practical man looking over the ground could determine the best manner of importing them, and, as remarked, I am informed that Belgium affords the cheapest entry, and if the cattle are suffered to rest in the rich pastures of that country the benefit would result in pecuniary profit.

With a view of answering the interrogatories contained in the cattle circular, I have endeavored to assist in this effort to increase and ameliorate the native breeds of cattle, which is justly considered one of the most important elements in the general agricultural prosperity of a country. In endeavoring to describe the various breeds of cattle found in France, and delineating the especial value of these breeds in such a manner that the American breeder could determine the advantages, if any, which would follow their introduction, I would merely further add that the only knowledge absolutely essential to one desirous of buying cattle in this market is that he should know what he wants and be capable of selecting the best specimens of the breed. A buyer could purchase as large a number as he wished with comparatively little trouble, for he could avail himself of the fairs, which are held annually, monthly, and weekly in all parts of France, where several thousands of cattle are exposed to sale and change hands.

If ignorant of the language, he can readily find an interpreter, or, if he asks it, his consul will find one for him and otherwise assist him.

THE SUITABILITY OF FRENCH CATTLE FOR THE UNITED STATES.

I unhesitatingly state, as the result of my study of this subject, that the intelligent stock breeder can nowhere better than in France find as good and great a variety of breeds of cattle from which to select those suitable to the various requirements of the United States.

CHAS. P. WILLIAMS,
Consul.

UNITED STATES CONSULATE,
Rouen, May 22, 1884.

Special statistics regarding French cattle.

Name of breed.	Origin of breed.	Age at maturity.	Weight of meat, net.	Color.
		Years.	*Pounds.*	
Flamande	North of France	3	1, 100	Red and brown.
Normande	Normandy	6	2, 400	Brindle.
Bretonne	Brittany	6	524	Light red.
De Salers	Salers	5	1, 370	Bright red.
Limousine	Limousin	3$\frac{10}{12}$	695	Yellow.
Charolaise	Saone and Loire	4	....	Light yellow.
Parthenaise	La Vendée	5	715	Pale red.
Mancelle	Maine and Loire	3$\frac{10}{12}$	740	Light red.

Name of breed.	Annual milk yield.	Milk to pounds of butter.	Size at maturity.		Live weight.	
			Cow.	Ox.	Cow.	Ox.
	Qts.	*Qts.*	*Ft. In.*	*Ft. In.*	*Pounds.*	*Pounds.*
Flamande	2, 700	11	4 6	....	1, 100	1, 800
Normande	3, 000	13	....	7 10	....	4, 200
Bretonne	1, 800	7	3 5	....	480	770
De Salers	1, 600	8	....	4 6	....	2, 200
Limousine	....	....	....	....	....	1, 030
Charolaise	....	....	....	4 7	....	850
Parthenaise	....	....	....	5 0	....	1, 100
Mancelle	....	....	....	....	....	1, 100

DIVISION OF LAND AND CATTLE-BREEDING IN FRANCE.

REPORT BY VICE-CONSUL MARTIN, OF MARSEILLES.

OLD-TIME CATTLE-BREEDING IN FRANCE.

Until a comparatively recent date the French peasant appeared to attach no value to cattle beyond that arising from their produce in labor or in milk. Every animal that was born was either expected to do service and toil in its peculiar capacity for the whole term of its active life, and was seldom turned over to the butcher before he had reached the age of ten years or more, or be slaughtered for consumption as soon as weaned and before its keeping would become an expense to its owner.

Hence the favor that veal still finds in France as an article of food, and probably also the great natural fault of the generality of French breeds, viz, slow maturity.

Under these circumstances the farmer who, partly on account of the advanced age of the animal and partly through the collusion of the butchers, could not even obtain the price originally paid for his cattle, had come to look upon it as a sort of necessary evil, and made no effort to improve or even to maintain the integrity of the original French breeds.

INSTITUTION OF CATTLE SHOWS IN FRANCE.

In 1854 the Government, perceiving the danger of this disposition of French farmers, instituted annual shows in the several regions of the country, where prizes were awarded to the best specimens of agricultural produce, and especially of cattle, with particular attention to improvement in the direction of meat product and early maturity. At the same time the growing welfare of the people brought about a marked increase in the consumption of meat, naturally attended by an advance in prices.

The farmer was not long in finding out that he could realize a profit in the sale of his stock if it was brought to the market in a fair condition, and perceived the advantage of renewing it oftener, and at the same time made some effort stowards improving its qualities and mending its faults.

CATTLE CENSUS OF FRANCE.

As to quantity there does not seem to have been decided progress made in the last fifty years. As far back as 1837, a census made in that year fixed the number of horned cattle at 9,936,538. In 1866, after the annexation of Savoy and Nice, it was estimated to be some 12,000,000; in 1876, after the loss of the rich provinces of Alsace and Lorrain, it was reduced to 11,351,220; and the returns for 1880, the last published, give an aggregate of 11,446,253.

That this number is not sufficient to meet the wants of the population is shown by the amount of importation of neat cattle in the same year, 1880, which was no less than 196,508 heads and exceeded the exportation by 137,207.

In 1881 the difference fell to 74,277 heads, but in 1882 it again rose to 108,571. The importation of butcher's meat is also large, and amounted for the three years above named, respectively, to 8,518,500, 5,745,100, and 6,028,500 kilograms.

DIVISION OF LAND IN FRANCE.

That the breeding of cattle does not keep pace with the increasing consumption of meat, nor find sufficient encouragement in the consequent advance of prices, can only be explained by the extreme division of land property in this country.

It originated at the time of the French Revolution, when all the estates belonging to the nobility (nearly the whole territory) were confiscated and sold at auction. Then the succession law embodied in the French civil code aggregated the effects of this first parceling of the territory.

It provides that each heir can claim to receive his share of the inheritance in kind, and that the share allotted to each should contain an equal distribution of the constituent parts of the estate, real and personal.

It is easy to imagine to what extent the working of this law has divided landed property in France since the beginning of this century.

Again, the French peasant allows the great desire, inherent to his nature, of owning the ground that he cultivates to allure him into purchasing small lots at rates which large land owners could not obtain for their whole property. The latter finding that they can by selling their land piecemeal realize profits from 20 to 30 per cent. larger, do not hesitate to dispose of it in that way.

The consequence has been, that while real estate at one time acquired almost incredible value (from $2.00 to $1,000 per acre, and for some exceptionally productive land as much as $1,600), nearly all the soil has fallen into the hands of the peasantry, who excel at reaping from the earth all that industry can achieve, but who too often lack the means of carrying on agriculture on a large scale. It is estimated that from 75 to 90 per cent. of the cultivated land of France belongs to what is called "petite culture," that is, to that class of farmers who work their own land with no other help than that of their children.

At the same time those who do not own land in their own right, or have none to expect by inheritance, flock to the cities where they find better remuneration for their work and thus contribute, together with the necessities of the military service in this country, in making scarcity of help one of the most serious grievances of French agriculture.

For this reason we see that almost all the productive land of the country is devoted to such culture as may be expected to give the best results under the smallest outlay.

A schedule of the share occupied by each important branch of agriculture may here be of interest:

Arable land.	Acres.	Proportion to total surface.
		Per cent.
Agricultural products:		
Wheat	17, 071, 120	....
Other grain	19, 936, 350	....
Leguminous plants	4, 970, 556	....
Potatoes	3, 322, 543	....
Beets	1, 174, 893	....
Colza	303, 218	....
All other culture	16, 450, 311	....
	63, 288, 991	50. 45
Pasture land and meadows	12, 378, 036	9. 86
Orchards	1, 526, 575	1. 21
Wood land and forests	19, 594, 268	15. 61
Vineyards	5, 336, 493	4. 25
Heath lands and other unproductive land	23, 370, 133	18. 62
Total	125, 494, 496	100. 00

DIVISION OF CATTLE IN FRANCE.

This peculiar division of land and culture in France has led to a similar division of the cattle-raising industry.

Nowhere in this country is it made a special pursuit, and the stock passes through many hands before it is finally turned over to the butcher. As a rule it is raised in those parts of the country where pasture land is abundant and the soil unfit for other culture. As soon as the young animal is strong enough it is taken to one of the numerous fairs that are held in all parts of the country; a farmer, whose ground is not extensive, will buy the calf and submit it for a short time to the light work which he requires, and after a few months, when the yearling has grown in his hands, he will take it again to the fair, sell it at a small profit, and buy another younger animal with the same prospect of profit for the future.

In this wise, the stock is bought and sold several times before it passes into the hands of an "engraisseur," who makes it a special business to buy from farmers cattle which he brings to a satisfactory condition of "fat," and finally sells to the butcher.

Under this system the different original French breeds have necessarily become mixed to a large extent, and it is difficult to determine exactly the number and importance of each. In a general way, cattle are most numerous in the northern and eastern parts of France where milk is a common diet; in the south, where oil supersedes butter very largely, the breeds show a greater aptitude for labor; and in the southeastern region, where neither milk nor labor is in great demand, there is no special breed, and the number of cattle is extremely limited.

In the seven departments forming this consular district meat cattle only number 110,018 head, or less than 1 per cent. of the total of France, and it is, so to speak, all imported either from the cattle-raising parts of France, or from Italy, Sardinia, and Algeria.

This made it impossible to collect any information directly from the breeder, which would have been of far greater value and interest; and in the following description of the most important French breeds I had recourse to official statistics as to numbers and to the works of the Marquis de Dampierre and M. J. Magne as to the several breeds.*

CATTLE CENSUS OF FRANCE.

As no census of the stock of this country was ever made with special regard to the several breeds, I have adopted the plan in the following statement to give the number of cattle belonging to each agricultural region of France which will permit a comparison of their relative importance:

District.	Area.	Proportion to area of district.		Number of cattle in 1880.				Number of head to each 1,000 acres.
		Arable land.	Pasture land.	Oxen and bulls.	Cows.	Yearlings.	Total.	
	Acres.	*Pr. ct.*	*Pr. ct.*					
Eastern	16,693,000	54	13	356,042	1,138,040	275,441	1,769,523	106
Northern	22,920,107	70	12	209,230	1,698,615	438,666	2,346,511	102
Western	19,989,243	58	13	907,210	1,788,925	492,137	3,188,272	159
Central	19,455,312	57	16	311,593	1,129,777	340,578	1,781,958	92
Southwestern	16,472,645	34	9	441,944	598,541	145,445	1,185,940	72
Southern	12,936,014	39	7	155,831	381,185	88,145	625,161	48
Southeastern	17,028,175	28	4	110,889	378,159	59,850	548,898	32
Total	125,494,496	....	....	3,492,739	7,113,242	1,840,272	11,446,253	......

---

*These interesting descriptions of French cattle are omitted, being fully covered by some of the other reports from France.

PHYSICAL FEATURES OF FRANCE BY DISTRICTS.

*Description of Northeastern and Eastern France.**—The northeastern and eastern regions are generally mountainous, covered with wood and pasture land. Unproductive land is extensive and agriculture less advanced than in most of the other regions. The vineyards are important and produce the celebrated wines of Champagne and Burgundy. Rye is more important than wheat, and colza and hemp are also largely grown.

Nearly all the geological formations can be found in this mountainous region, the primary and granitic in the Alps, the jurassic in the Jura range and in the greater portion of the region, the cretaceous in the Champagne district, the triassic and permian in the Vosges, the porphyraceous in the Beaujolais and Morvan provinces, and the alluvium in that part of Alsace that was left to France.

The climate is more extreme than in any other part of France; the mean summer temperature is 64°, that of winter 32°; the rainfall amounts to 26.22 inches per annum. The rainy days average 137 in the year, and frost 70.

The prevailing winds blow from the northeast and southwest.

Description of Northern France.†—The northern region is the richest, most fertile, and best cultivated region of France.

The land, which is nowhere in the region absolutely unproductive, is only broken by low and cultivated hills. The proximity of Paris insures for all the produce of the region a certain and profitable outlet, and there is scarcely a branch of agriculture that is not followed.

There, too, landed property has better resisted the disintegration prevalent in France, and permitted of the valuable use of agricultural machines. In brief, every produce of the French soil is extensively and profitably grown in the northern region, except a few that require a warmer climate—the olive, orange, and grape—although some vines are to be found in some parts of the region.

It belongs entirely to the miocene formation, jurassic, calcareous, and tertiary. The climate is tempered by the sea breezes and is equally free from intense cold and heat. The mean summer temperature is 63°; and that of winter 40°. The mild and damp winters are favorable to pastures, which acquire particular qualities from the beneficent sea air.

The rainfall averages 22 inches and the rainy days 140. Southwest and northeast winds are prevalent.

Description of Western France.‡—The western region, much alike to the northern region in its principal features, is far from equaling it in riches and advanced agriculture.

Brittany, which forms the principal part of the region, is of primary and granitic formation. It is covered with heaths and *landes*, and cannot raise successfully anything but buckwheat.

The other parts of the region have greater analogy with the northern region, and in a general way the description given of the latter applies also to the former.

Description of Central France.§—The central region contains two different parts, the plains in the north, and the central table-land in France.

---

* The breeds raised in this district are the Charolais, the Comtoise, and the Morvan.

† The breeds of cattle raised in Northern France are the Normandy and the Flemish.

‡ The breeds of cattle raised in Western France are the Breton, the Choletais or Parthenau, and the Manceau.

§ The breeds of cattle raised in Central France are the Limousine, the Salers, and the Aubrac.

Through excessive wood-clearing the plain region has become marshy, unproductive, and unwholesome.

The soil is generally sandy, with an impervious clay substratum, where no vegetation is seen but heaths and broom. In marly parts some rye and a much larger quantity of buckwheat is grown.

The "Plateau Central," of granitic and volcanic formation, embraces some fertile valleys,that of Limagne among others, remarkable by its rich loam soil, but the vegetable earth, which is most common, has been formed by the disintegration of feldspathic rocks, is light, and fit only for woodland and meadows.

Greenswards, consisting chiefly of an herb called "Mardus stricta," are found on the highest summits of the table-land. Under those circumstances the region naturally devoted itself to the cattle-raising industry, and the "Plateau Central" supplies nearly all the different parts of France with large quantities of much esteemed stock.

The climate, although colder, owing to the altitude, is not excessively so, and can compare favorably with many other parts of France.

*Description of Southwestern France.**—The southwestern region, which is inclosed between the ranges of the Cevennes and the Pyrenees at the east and south, is entirely composed of plains and valleys, with the exception of the *landes*, a wide sandy expanse, resting on a pudding-stone substratum; the region is fertile and in advanced stage of culture that embraces all the agricultural productions of France except the olive and orange.

The vineyards cover nearly 2,000,000 acres, and produce the well-known Bordeaux wines and a good deal of inferior brandy. The culture of Indian corn comes next in importance, and is especially extensive in the poorer district, where the peasant uses it for food for himself and his cattle, and as flour, fuel, and bedding. The natural pasture land is also plentiful, and sown meadows give a good supply of lucern, and particularly clover, the use of which has grown to form an important branch of trade. The geological formation is entirely of the tertiary order in the plains, and in the Cevennes and Pyrenees partakes of different formations, the granitic and jurassic predominant.

The climate is moderate, the mean temperature being 69° in summer and 41° in winter; the rainfall averages 23 inches, distributed in 130 rainy days in the year. Frost is seldom seen for more than 35 days.

Description of Southern and Southeastern France.—The southern and southeastern regions are quite different in every respect from all the other regions of France.

The climate, produce, culture, and general aspect are entirely peculiar to the region. Wood and pasture lands are scarce, the calcareous hills and mountains, stripped of the last vestige of a tree, are barren and grow nothing but shrubbery and aromatic herbs, on which constantly browse numerous herds of starveling sheep that are led from one hill to another and lay waste all those parts of the country through which they travel.

Three-fifths of the region are utterly sterile and deserted. On the other hand, the two other fifths are remarkably productive and turned to culture which cannot be attempted in any other portion of France. The olive, orange, mulberry trees thrive admirably; the vine is extensively cultivated and produces immense quantities of wine, which, although of inferior quality, brings an important revenue to the country. In some part flowers grow in the open air at all times of the year, and give rise to numerous factories for the preparation of essential oils and perfumery, and to an important production of honey.

---

* The breeds of cattle raised in Southwestern France are the Garounaise, the Bazadais, the Gascon, the Bordelais, and the Pyrenees.

The drought is nearly permanent, and is broken only by floods of rain which are more injurious than beneficial, as they frequently occasion dangerous inundations and carry away a good deal of precious vegetable earths.

In the Valley of the Rhone the rainy days only number from 120 to 130 in the year, and 53 on the Mediterranean shore, and still the rainfall is larger than in any other parts of France, and averages 38 and 26 inches respectively.

The climate is more moderate on the sea-shore where the mean temperature is 72° in summer and 42° in winter. In the interior the mean winter temperature is 35°.

The prevalent winds are the northwest or mistral, a cold and violent wind, and the southeast or rainy wind.

CAMARGUE CATTLE.

The only original cattle breed of the region is the Camargue breed. Its only interest lies in the fact that it lives in a semi-wild condition in the Camargue, a marshy delta of the river Rhone. It is of small size and measures about 4 feet 4 inches; its color is generally black, sometimes red; the head is elongated; the horns are long and in the shape of a bow.

There are no stables in the delta, and the herds are allowed to roam through the island at liberty all the year round.

When the young calves are born they are fastened to pickets sunk in the ground and have to wait until their mothers are willing to come and nurse them.

No use has ever been made of the breed except for bull-fights, and it is rapidly disappearing.

At the present day there are not more than eight hundred head living in Camargue. All the other cattle found in the region is imported from other parts of France, or Algiers, Sardinia, and Italy.

FRENCH IMPORTS AND EXPORTS OF CATTLE.

To close this report and give an idea of the cattle trade as carried on in France, I have appended the following schedule of the importation and exportation of cattle for the year 1882:

IMPORTS.

Countries.	Oxen.	Cows.	Bulls.	Yearlings.		
				Male.	Female.	Calves.
Imported from—						
Italy	57,058	17,749	311	....	....	21,127
Algeria	18,730	....	....	....	....	....
Belgium	3,192	20,148	1,165	2,073	2,126	24,299
Switzerland	....	5,674	....	966	406	6,665
Germany	4,240	3,785	....	872	1,360	3,382
Holland	....	3,048	....	....	226	....
Spain	....	288	....	201	....	598
Other countries	....	....	264	167	121	743
Total	83,220	50,692	1,740	4,279	4,239	56,814

EXPORTS.

Countries.	Oxen.	Cows.	Bulls.	Yearlings.		Calves.
				Male.	Female.	
Exports to—						
England	21,094	....	....	....	....	1,196
Belgium	11,052	9,505	847	62	2,107	736
Switzerland	13,066	5,006	83	....	508	4,500
Spain	....	8,272	....	1,063	....	1,099
Germany	....	6,439	65	88	1,370	1,297
Other countries	1,210	721	70	10	273	355
Total	46,422	29,943	1,065	1,223	4,258	9,183

J. S. MARTIN, JR.,
Vice-Consul.

UNITED STATES CONSULATE,
Marseilles, February 5, 1885.

CATTLE RAISING IN THE SOUTHWEST OF FRANCE.*

REPORT BY CONSUL ROOSEVELT, OF BORDEAUX.

In the departments of France forming the consular district of Bordeaux there are five principal breeds of cattle, viz, the Garonnais, Bazadais, Bordelais, Landais, and Limousin.

ORIGIN OF THE BREEDS.

Garonnais.—Native of the country through which the Garonne River flows; the most abundant breed of the Southwest of France; has always been known in the country, and has not been crossed.

Bazadais.—Issued from the Pyrenean breed and imported, at the beginning of the sixteenth century, into the environs of the town of Bazas; has a great resemblance to the Garonnais, and has never been crossed; is considered one of the oldest breeds of France.

Bordelais.—A cross-breed of Brittany and Dutch; was imported into the locality at a remote period; is preserved from degeneration by the constant renewal of the blood.

Landais.—Issued from the Pyrenean breed, and raised only in the department of the *landes* (moorlands); has undergone the changes naturally due to the difference of climate and soil, and has become adapted to the country, where, under the local influences, it has almost become a new breed; has not been crossed.

Limousin.—Raised especially in the environs of the town of Limoges; seems original to the country; has not been crossed.

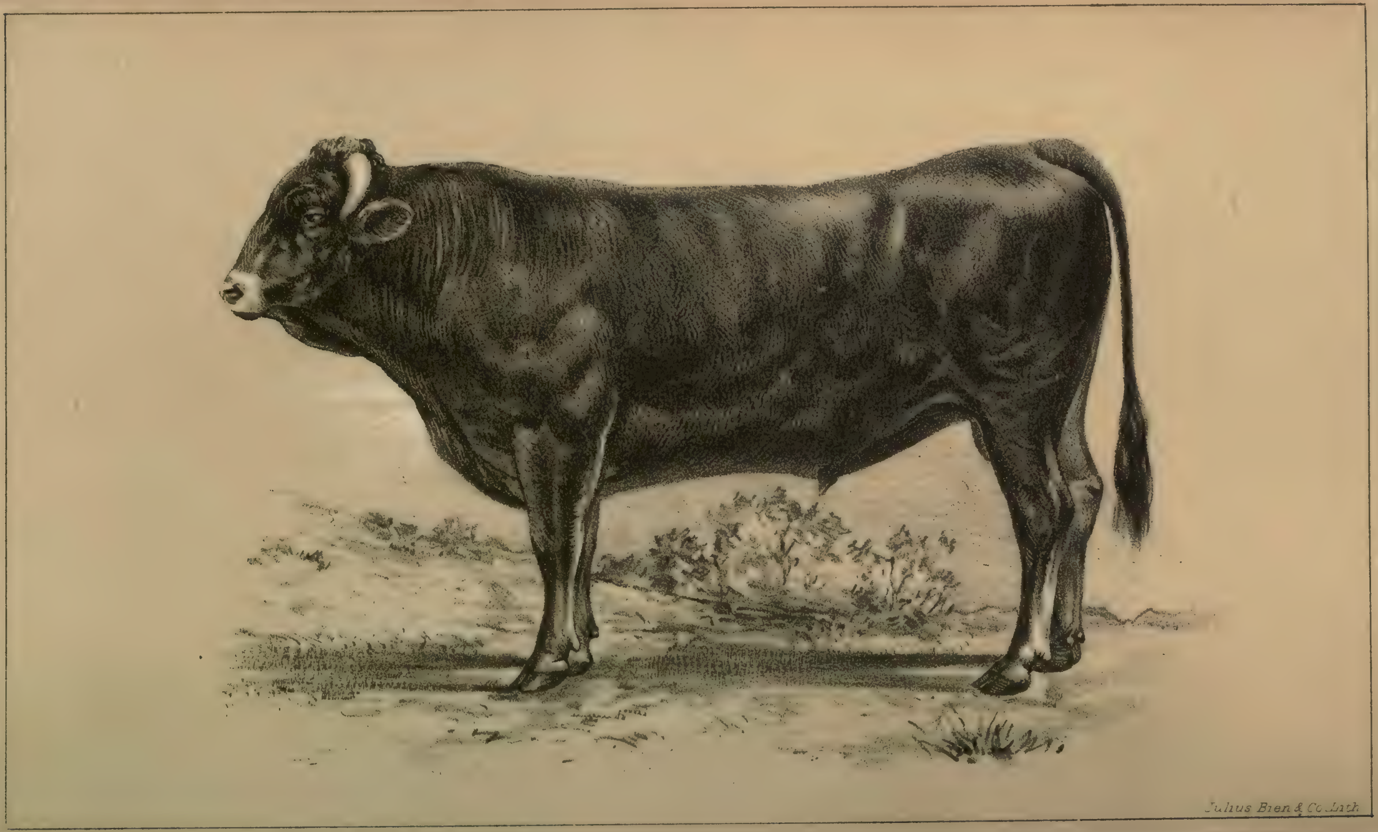
DESCRIPTIONS AND GENERAL CONSIDERATIONS.

Description of the Garonnais.—Buff color, sometimes darker about the head, hoof, and tail; bull, 5 feet 4 inches; cow, 5 feet tall, without being

---

* NOTE BY CONSUL ROOSEVELT.—This report is compiled from information derived from the municipal veterinary surgeon in charge of the slaughter-house of the city of Bordeaux, M. Marcel Courregelongne, one of the most eminent cattle-breeders of this department, and also secretary of the Society of Agriculture of the Gironde; from the manager of the General Milk Company of Bordeaux, the municipal records, the newspapers of this locality, and from the most reliable authors.

PLATE 117



Julius Bien & Co. Lith.

GARONNAIS BULL

"high above ground;" very thick bones and strong limbs; thick muscles, long body, well supported; deep but rather narrow chest, flat ribs, rather thick neck, fore quarters more bulky and heavier than hind ones; rather flat thighs; thick skin, thick flat horns bent forward and generally downward.

This fine breed forms the wealth of the Southwest of France, to which it gives its work and meat. Strong, docile, and handy, it works well and much, but with a slow pace.

The ox takes flesh easily; the cow hardly has milk enough to feed her calf.

Raising Garonnaise calves.—If the calf is intended to make a beast of burden, he is fed, until four months old, by his mother and at the same time by a Brittany cow used as assistant nurse (that cow assists in feeding three calves), then he receives a little bran until six months old, when he is weaned. He is then sent grazing all day and stabled at night; he receives besides green or dry forage, according to the season. Such is the diet he will follow up to his last day. When thirteen months old, he is castrated and begins to be broken to the yoke; from that age to that of two years and a half, he is employed to do the light work of the farm; from two and a half to five or six years old, he is put to the coarser works of agriculture, then stabled to be fattened. The fattening begins in February and is finished at the end of September. The animal receives at first radishes and turnips, which are chopped with straw, then purple clover and corn fodder; to that green forage is added bran, corn, flour, and rape or linseed cake; during all the time of fattening the ox is not allowed to go out.

A calf three and a half or four months old is sold for the stall at from $18 to $30.

If the calf is intended to be kept for reproduction, he is weaned only when nine months old, and up to that time has three nurses besides a special food of meal or floury substances; he is then sent grazing during the day and stabled at night; when ten or eleven months old he may be sold for $60 or $70; he begins to serve when fifteen months old, and when he reaches the age of thirty months he becomes too heavy for covering; he is then fattened without being castrated, and sold to the butcher at the price of 7 cents per live pound. The cows are covered when fifteen months old; they go to pasture during the day, and receive a ration in the stable where they are kept at night; this ration consists of green or dry forage according to the season.

Working Garonnaise cattle.—The cows work like the oxen. When farrow or too old to work, they are fattened and sold to the butcher, who pays about 7 cents per live pound.

An ox at the age of maturity, five or six years old, weighs 1,100 or 1,200 pounds. After having been taken away from the work and fattened he weighs from 1,300 to 1,400 pounds. He is then sold to the butcher at from $150 to $175, and yields 55 per cent. of the live weight in meat. When specially fattened for the stall the ox weighs up to 2,500 pounds, at about four years of age. Its flesh has a fine grain.

A pair of working oxen, from four and one-half to five years old, are sold at from $260 to $300.

A pair of Garonnais oxen can pull a cart-load (two-wheeled cart) of 10,000 pounds weight for 12½ miles in one day, but can work at that rate only three times a week. The working pace is about 1½ miles per hour. The working animal is fed on bran, dry hay, and sometimes a little ration of oats.

Meat product of Garonnais cattle.—The following is the product of two young oxen which had received premiums at a cattle show:

No. 1, three years and ten months old:		
Live weight at the slaughter-house	pounds..	1,348
Weight of the four quarters	do....	848
Proportionate weight of the four quarters to the live weight	per cent..	62–91
Weight of the tallow	pounds..	110
Proportionate weight of the tallow to the four quarters	per cent..	12–83
Weight of the skin	pounds..	107
Proportionate weight of the skin to the four quarters	per cent..	12–96
No. 2, three years and eleven months old:		
Live weight at the slaughter-house	pounds..	2,176
Weight of the four quarters	do....	1,366
Proportionate weight of the four quarters to the live weight	per cent..	68–78
Weight of the tallow	pounds..	162
Proportionate weight of the tallow to the four quarters	per cent..	13–19
Weight of the skin	pounds..	136
Proportionate weight of the skin to the four quarters	per cent..	10–00

Garonnais cross-breeds.—An author says that this breed deserves the name of "Shorthorn of the South," having the same form and bearing and the same propensity to fatten when young. It is supposed to be a cross-breed of Garonnais and Dutch. According to reliable documents large numbers of Garonnais were exported to England in the fourteenth and fifteenth centuries, when the South of France was occupied by the English. This breed has never been crossed by any foreign blood. It is left to itself for reproduction, the raisers hardly taking any care to secure good bulls. The cattle-breeders say that this breed should not be crossed in its native country, because that would make it lose the qualities which render it particularly adapted to the locality. All crossings hitherto tried have proved complete failures. This breed represents about two-thirds of the cattle in the department.

Garonnaise grazing country.—The altitude of the country is about 250 feet above sea-level. The mean temperature is 56° F.—in summer, 72°; in winter, 43°. The soil belongs to the secondary and tertiary periods.

The agricultural soil is composed of—

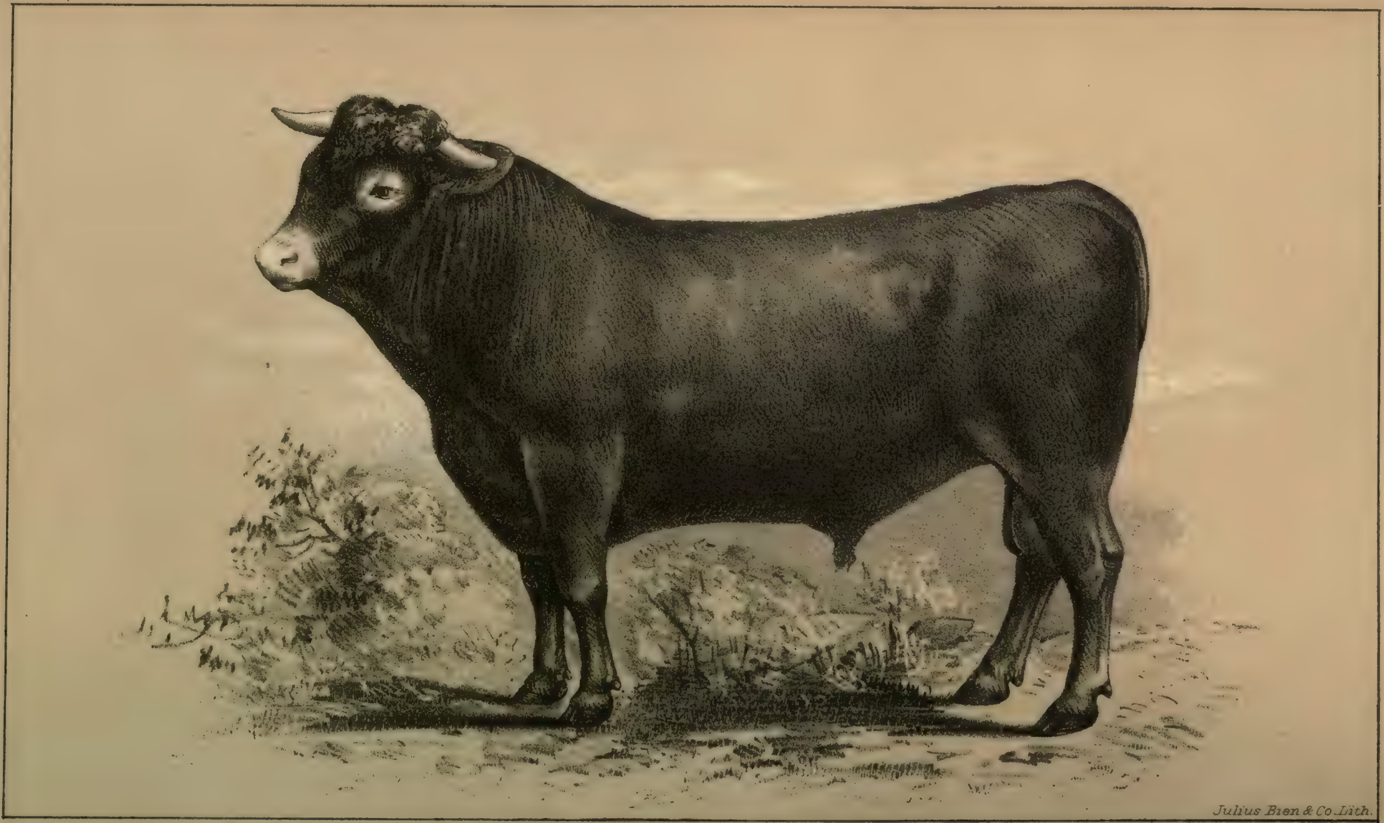
	Acres.
Limestone	132,750
Rich compost	32,800
Gravel	1,700
Stony ground	18,900
Sandy ground	27,500
Heathy ground	12,350

The soil of the plain and great valleys is very fertile. The plain of the Garonne, of proverbial fertility, lies on alluvial ground 12 feet deep. The culture of the ground is triennial; first year, wheat and cereals of spring and autumn growth; second year, green forage; third year, hemp, tobacco, rape, and linseed.

THE BAZADAIS CATTLE.

Description.—Dapple dark gray; nose, anus, and inner part of thighs white; eyes encircled with white hair; some of cows are light gray. Bull 4 feet 8 inches, cow 4 feet 4 inches high. The animal is compact, "close to the ground," with thin, dense bones; powerful muscles ended by strong sinews; harmonious and wonderfully balanced body; loins very well attached. The animal is built for fatigue and endurance, with broad and neat articulations; hind quarters broad, well made, with thick flesh and muscles from rump to knee; hoofs hard and of a good quality; head short, broad at the forehead; horns well attached; neck

PLATE 118



Julius Bien & Co. Lith.

BAZADAIS BULL

short; ribs round; stands remarkably plumb on his legs; tail well attached; skin rather thick, of a light tissue, with somewhat rough hair. Being energetic and having a quick pace, these animals are eminently fit for work. Yoked to enormous two-wheeled carts, they carry prodigious loads under a scorching sun, and sometimes with a sandy dust which renders their work very painful.

With all the qualities of a beast of burden, the Bazadais is also good for the butchery, and, though weighing less than the Garonnais, is frequently rewarded at the fat-cattle shows. It is preferred for the butchery, being in general fatter than the Garonnais; its flesh is better, gives more of the choice cuts, and yields a greater average of meat—more than 60 per cent. of the live weight.

The ox takes flesh much more easily than that of the Garonnais breed. The cow hardly has enough milk to feed her calf.

Bazadais calves.—If the calf is intended to make a beast of burden he is treated exactly as the Garonnais; sometimes sent grazing, but generally kept in the stable. He is castrated when twelve months old, and begins to be broken in three months after; he is then used for light plowing and harrowings. When three years old he is yoked with a companion to a two-wheeled cart, and carries 2,500 pounds, but for short distances only. When four and a half years old he is used for hard work till the age of six or seven, without showing any sign of great fatigue.

Weight and value of Bazadais oxen.—A pair of Bazadais oxen can pull 10,000 pounds weight for 12½ to 13 miles in one day, but can work at that rate only three times in a week. The working pace is about 2 miles per hour. The working animal is fed on bran, dry hay, and sometimes a small ration of oats. A pair of working Bazadais oxen from four and a half to five years old are sold from $220 to $260.

One-third of the Bazadais working oxen are used for carting heavy loads, one-fifth are sold for the vineyards of Medoc and Sauterne, the rest are employed for agricultural purposes in the Bazadais region. This latter portion is fattened when from four and a half to six years old, whilst those belonging to heavy works are fattened only from the sixth or seventh year of their age. The fattening begins in May and terminates at the end of February. From May to October the animal is fed on green forage, corn fodder, vetch, and purple clover. From October he is fed on hay, bran, corn meal, rape, and linseed cake.

A Bazadais ox at the age of maturity (five or six years) weighs from 900 to 1,000 pounds; after being fattened as above he weighs from 1,100 to 1,200 pounds, and is then sold to the butcher at the rate of 12 cents per pound live weight.

The cows work like oxen. The calves are bought for the butchery from $18 to $30 a head; their flesh is very white and greatly praised. When raised expressly to be fattened, on reaching its full growth, the animal weighs about 2,000 pounds.

In the southwest of France the Bazadais represents about one-third of the bovine species and the Garonnais two-thirds.

The Bazadais as a bone-making animal.—A reliable author mentions as a known fact that in the country where the Bazadais is raised the horses become small and slender, with small carcasses, whilst the oxen become compact, thick, and long; in other terms, in the same country, under the same influences, and with the food produced by the same soil, the bony system of the horse is reduced to the smallest proportions, whereas that of the oxen takes a great development. This would tend to prove that the Bazadais oxen have a particular tendency and aptness to assimilate the calcareous salts contained in the pastures. If the Bazadais ox is really endowed with the faculty of "easily making" bones, it would be a useful importation into countries the soil of which is too poor in calcareous salts to properly feed beasts of burden; and, on the other hand, if it was imported into countries the soil of which would supply abundant calcareous salts, the frame might be, in the course of time, developed to a great size and power.

The Bazadais grazing grounds.—The altitude of the country in which that breed is raised is 270 feet above the level of the sea. It is composed of flat grounds, with little valleys, where spring many calcareous waters. The mean temperature is 62° F.—in summer, 69°; in winter, 43°. The soil belongs to the superior miocene formation, characterized by the shell-marls, containing all the varieties of cerites with yellow conchiferous sands and yellow or gray clay, often characterized by the *Ostrea undata* and *Ostrea crispata*. The ground is undulated and varied. On the same farm clay, sand, gravel, limestone, &c., are met with. The underground is as varied as the arable ground; it is composed of clay, flint, stone, and limestone, but is not deep.

The culture is biennial—first year wheat and rye, second year corn, potatoes, beet-root, and spring forage; besides every farm has about one-third of its extent in artificial meadows.

THE BORDELAIS CATTLE.

Description.—Black and white (piebald). Bull, 4 feet 6 inches; cow, 4 feet 2 inches high. Hind quarters developed as compared to the fore quarters; thin limbs; small bones; angular forms; pelvis very wide; neck thin and almost fleshless; head fine; horns thin, black, bent forward, and often rough; udder expanded without being fleshy; milk abundant.

Qualities of the Gironde Bordelais.—This breed was imported into the Gironde many years ago, for dairy purposes solely, being the result of crossing between the breeds of Brittany and Holland; it was and is still maintained by constant importations of Dutch bulls. It can hardly be called a breed, as it does not reproduce itself exactly. It is comparatively scarce, being used only for the dairy. Of the Brittany cow, from which it originates, cut 22, gives a pretty correct idea of it. The female only is known and described, as the young males are sold for the stall. The bulls and cows when too old to breed are sent to the slaughter-houses, but the meat is of inferior quality. The weight of the cow is about 500 pounds when at maturity, 4 years old; it is then sold at from $80 to $100. The price of the bull is $80; after two years' service he is sold to the butcher.

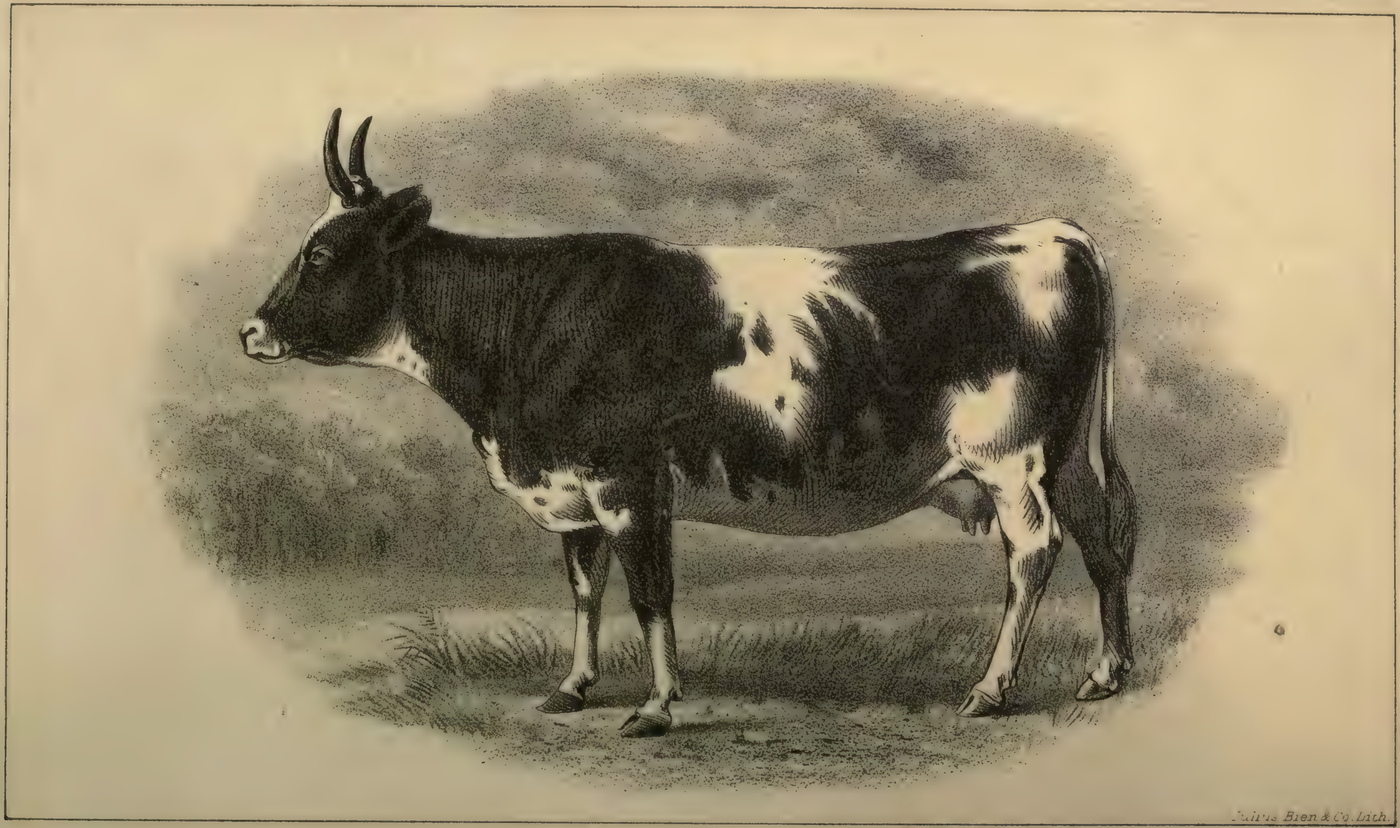
The Bordelais as milkers.—This is the only breed which provides the department of the Gironde with milk. After calving the cows give 4½ gallons of milk a day for one month. Afterwards it gradually goes down to 2 gallons. The average quantity given by one of these cows amounts to about 650 gallons per annum, with a proportion of 2.90 per cent. of butter and 3.35 per cent. of dry caseine.

The Bordelais not suitable for exportation.—The Bordelais could not be profitably exported—(1) because it degenerates if not renewed by frequent crossing; (2) because as a milker it is not so good as the Normandy cow.

The grazing-grounds of the Bordelais.—The altitude of the country is about 150 feet above sea-level.

It is generally composed of flat and undulating ground. The arable soil is composed of clay, pebble, limestone, and sand. The mean tem-

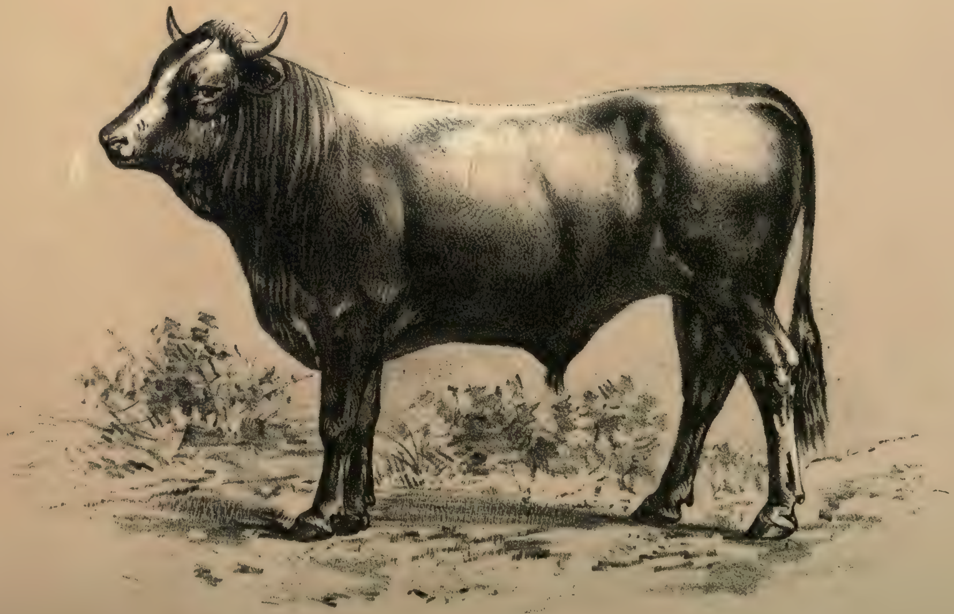
PLATE 119



Julius Bien & Co. Lith.

BARDELAISE COW

PLATE 120



Julius Bien & Co. lith.

LANDOIS BULL.

perature is 57° F.—in summer, 69°; in winter, 43°. The soil belongs to the Tertiary period.

Feeding and housing Bordelais cows.—The cows of the Bordelais breed are left in the fields day and night as long as the weather permits; when stabled (in cold or snowy weather) they are fed on second-crop hay, coarse cabbage, and any kind of green food that may be had cheap. Those kept by rich people have rations of bran added to the above. When the pea season sets in, very large quantities of that vegetable are daily shelled in the city of Bordeaux at the establishments for preserving vegetables, and the pods are sold for the cows, who are very fond of them. That food gives a particularly sweet taste and pleasant flavor to the milk.

EXPERIMENTAL CATTLE-FEEDING IN FRANCE.

It may be interesting to note the following remarks, being the result of experiments made by a breeder of dairy cows, although such experiments have not been made on local breeds.

To properly keep cattle in France requires every day 1 pound 11 ounces of hay, or the equivalent of it, for each 100 pounds weight of the live animal. An animal, to be completely satisfied, requires every day one-thirtieth of his weight. Besides that one-thirtieth in dry substances, he wants four-thirtieths of water, or any other liquid contained in the food. If, to be completely satisfied, a cow requires a daily food of 3⅓ per cent. of its weight, and if 1⅔ are necessary to sustain life, it ensues that the half of the ration is *keeping food* and the other half is *productive food.* Each pound of productive food gives one pound of milk, or increases by nearly 1 ounce the weight of the calf in the mother's womb; and for the animals which are being fattened, 10 pounds of forage give 1 pound of increase in weight. The calf at its birth weighs one-tenth of its mother's weight. During the first month after calving, the cow gives a weight of milk equal to 3½ per cent. of her weight. Afterwards the milk diminishes gradually.

THE LANDAIS CATTLE.

Description.—Buff color, with a lighter hue around the eyes and the extremities. In some animals that color is darker, and sometimes tinted with bay. This breed is much smaller than any of the before mentioned the bull being only 4 feet 4 inches and the cow 4 feet high. It is a small or rather mean variety of the great Pyrenean family, hardly interesting to others than the inhabitants of those barren countries. The animal is small, compact, well-shaped, energetic, and quick, with long thin horns, dead white, with black tips. It is extremely sober, and is noted for its endurance; its fine and nervous limbs, like those of the Devon breed, have a peculiar character and prove its swiftness. The animal is kept in good condition, in spite of hard plowings, with very little forage, and that of the worst kind. The cow, though not strong, is equally enduring, and without extra food works very hard, even whilst feeding her calf. The animal trots very well without losing breath; oxen unaccustomed to the cart have been known to travel from 47 to 50 miles in one day and night.

A pair of Landais oxen in working condition, four and a half to five years old, are sold at $180 to $200. When specially fattened the ox may reach the weight of 1,600 pounds. In spite of its qualities this breed is not of sufficient value to export.

The grazing grounds of the Landaise.—The altitude of the country is 160 feet above the level of the sea.

Flat and barren ground (moorlands). Mean temperature in summer, 72°; mean temperature in winter, 44°.

THE LIMOUSIN CATTLE.

Description.—Buff color, with a paler hue at the inner part of the limbs; large soft eyes, surrounded, as well as the muzzle, by a whitish circle. Smaller than the Garonnais, but larger than the Bazadais, thus giving an average height of about 4 feet 6 inches for the cow and 5 feet for the bull. There is a great variety in the size of the animals, owing to the places where they are raised. They have a softer skin and are much finer and less bony than the Garonnais. Body rather long, withers high and not muscular; hind quarters narrow; short neck; thick head; horns pale, with brownish tips, flattened towards the base, not always well bent, turned forward and often downward. The cow is small, delicately shaped, and would be remarkably fine if not overworked. She has round ribs and well-made hips; is very spirited, and works much more quickly than the ox, which goes slowly and lazily. The cow gives scarcely any milk. The cause of this difference is that the cow is the exclusive product of the locality, which is poor, whereas the male calves and young oxen are the objects of an active trade, and are bought by persons who take them into richer countries, where they are fed preparatory for work and the slaughter-house. The difference in the diet makes the difference in the size. The Limousin makes flesh more rapidly than the Garonnais, and the quality of the meat is superior.

A pair of working oxen bring from $240 to $280. When specially fattened a Limousin ox will weigh about 2,200 pounds.

Grazing grounds of the Limousin.—The altitude of the country is 300 feet above sea-level.

Highest temperature in summer 90°; lowest temperature in winter, 10°. Soil of the primitive period, formed by the desegregation of granitic, gneissoid, porphyric, and feldspathic stones.

The arable ground is clayish, gravelly, or sandy, without a sufficient thickness, which causes many large plains to be covered with heath. The substratum is clayish or loamy, rather permeable.

The cultivation is biennial. First year, fallow, black wheat, radish, and potatoes; second year, rye or wheat.

The soil is undulating, the climate damp and cold, and liable to great variations of temperature.

Besides the above principal breeds, this district contains a few other of lesser importance which never come on the market of Bordeaux, and which, for that reason, are not known.

HOW TO EXPORT CATTLE FROM BORDEAUX TO THE UNITED STATES.

The best and only method of direct exportation to the United States from Bordeaux is by the Bordeaux Steamship Company, which makes regular monthly voyages. The conditions of the company, submitted to the emigration laws, are the following:

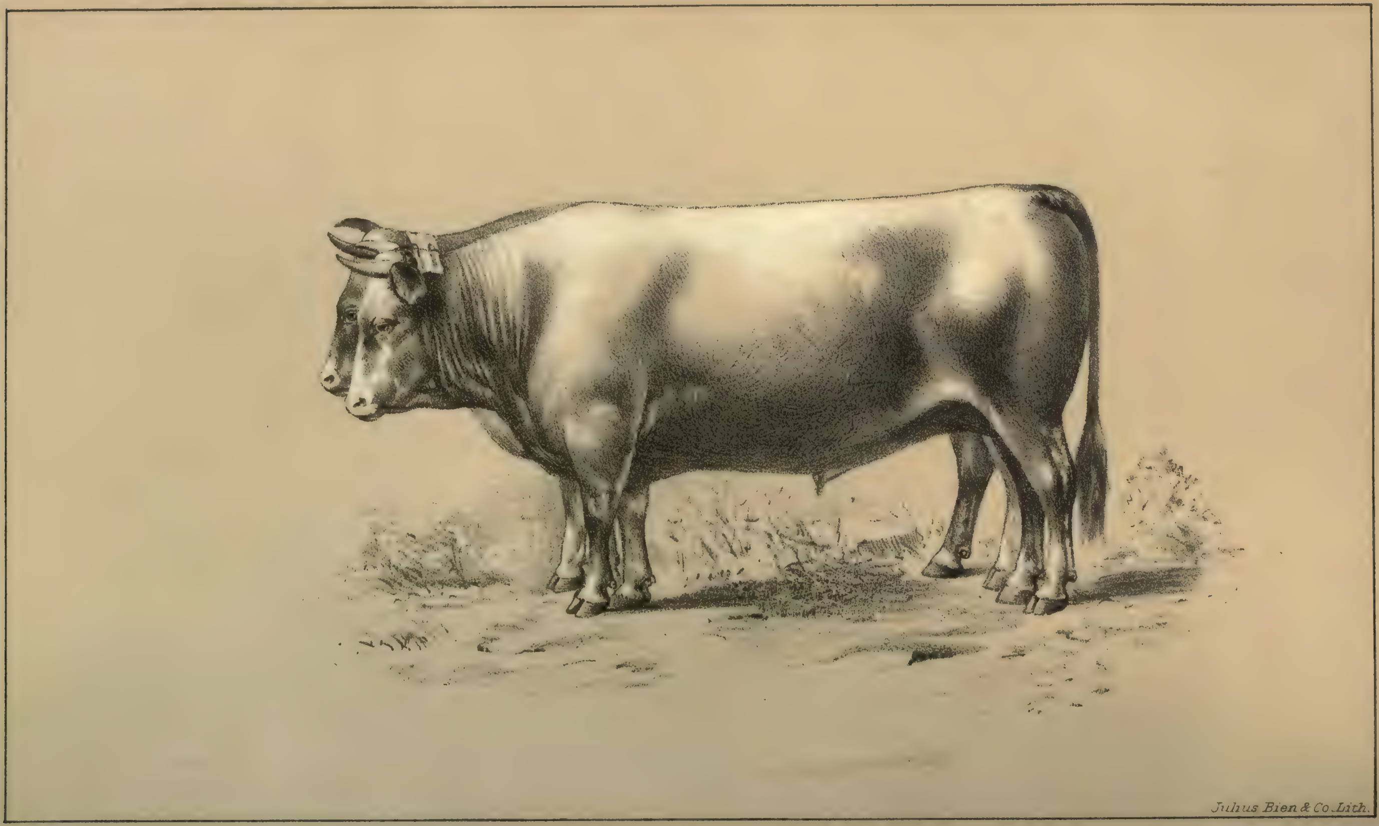
(1) Only ten head of cattle can be carried at a time.

(2) The animals will be placed on deck.

(3) The freight for each animal will be $80, including shipping, landing, attendance on board during the passage, and accommodation.

(4) The food will be provided by the shipper. The daily food required for an animal on board is 10 pounds of hay and 8 pounds of bran. The wholesale price of hay is about 80 cents per 100 pounds,

PLATE 121



Julius Bien & Co. Lith.

LIMOUSINE BEEF CATTLE

bran $1.60 per 100 pounds. Counting fifteen days from date of shipping to that of landing, both inclusive, each animal would eat:

10 pounds of hay, × 15 = 150	$1 20
8 pounds of bran × 15 = 120	1 92
	3 12

This added to the freight makes a total of $83.12 per head. The prices of frieght of the Bordeaux Steamship Company applies to choice animals carefully attended to, but the freight of animals sent in cargoes by American ships would be much cheaper.

FRENCH BREEDS SUITABLE FOR EXPORT TO THE UNITED STATES.

Among the breeds hereinbefore mentioned only two might perhaps be worth importing into the United States, the Garonnais and Bazadais. The former, on account of its size and powerful frame; the latter, on account of its energy as a beast of burden, of its yield in good meat, and of its wonderful power of assimilating food. The cost price of a couple of choice Garonnais would be about $300, that of a couple of choice Bazadais about $260.

EXPORT OF AMERICAN BEEF CATTLE TO BORDEAUX.

It would not be advisable to import any breeding animals into this district, because all the crossings hitherto tried with the local breeds have proved complete failures, and consequently the cattle raisers are not inclined to try new experiments; if they were so inclined, they would choose bulls belonging to breeds known in France, and not purchase animals of a breed unknown to them.

If the importation of breeding animals is not likely to give any good result, the importation of live stock into Bordeaux for the butchery would, on the contrary, meet the requirements of the market, and the probabilities are that the introduction of such animals, if arriving in good condition, would be a profitable speculation.

In order to elucidate the matter, so as to bring the question within the comprehension of any person concerned, I shall first explain the manner in which the city of Bordeaux is supplied with meat, the part acted by the commissioners, who are the intermediates between the producers and the butchers, their systematic removal of live stock from the market in order to raise the prices, &c. This will be seen in the following extract of the newspaper *La Victoire* of Bordeaux, of December 16, 1880:

> Generally on arriving at Bordeaux the dealer cannot wait until his stock is sold and paid for; not being rich he requires ready money for other business. The commissioner is there, ready at hand; he examines the cattle, values it after his own fashion, tries to hint that the butchers are well provided, the market bad and overstocked, &c.; he advances to the dealer a certain sum of money, about three-fourths of the value of the cattle; but often, to end sooner and not to wait ten or fifteen days for the settlement of the sale, the merchant prefers to transact for a trifling profit and gives up the cattle to the commissioner, who then makes the best of it.

The same article mentions the punishment which the commissioners inflict upon the dealers who do not prove sufficiently accommodating:

> Frequently the commissioners send their employés to the fairs of the region in order to prevent sales from the dealers who were unyielding to them.

The part of the commissioner is thus defined in *La Victoire* of December 3, 1880, by a letter of Mr. Olagnier, a municipal councilor, who made a special study of the question:

> The commissioners are at the same time the bankers of the producers, from whom they most often discount the price of the cattle which is sent to them for sale; and of

> the butchers, to whom they sell the same cattle on a credit of seven or eleven days; they, besides, are merchants, buying and selling for their own account, and then, being holders of nearly all the cattle intended for the supply of our city's market, they can, owing to their small number, maintain the prices at a high figure. I have contended, and the fact is verified by two members of the municipal council who raise and sell cattle, that the commissioners of Bordeaux pay for cattle a *lower price* than that paid by the commissioners who supply the markets of Paris, while it is a well-known fact that beef is cheaper in Paris than in Bordeaux.

Consulting the records of the municipal council I read in the report of the sitting of November 12, 1880, the following statements corroborating the preceding one:

> Correspondents and at the same time bankers of producers and of the butchers, and being, besides, merchants, they centralize the cattle, deliver to the market only the number required to maintain the highest prices, and by the influence which they exercise on the butchers by advancing them money they paralyze the spring of competition, which is necessary to reduce prices to their real level.

At the sitting of the municipal council of February 12, 1880, one of the members, M. Min-Barabraham, read reliable documents showing that the commissioners paid their own price for the live cattle, and that, owing to their then scarcity of forage, the owners were obliged to get rid of their cattle at unremunerative prices, and after having quoted the report of a special commission named by the municipality to investigate the matter, the report showed that meat in the city of Bordeaux was dearer than in Paris or any other large city of France. He found that the price of meat was always increasing, "even in the years when the price of cattle had obviously gone down on account of bad forage harvests." M. Min-Barabraham mentioned that as far back as 1870 he called the attention of the council to the high price of beef; that a commission was then ordered to inquire into the causes of such dearness and try to remedy it; that in 1874 attention was directed to the constant and unreasonable increase of prices, when the mayor appointed a new special commission to investigate the former, and also to find the means of admitting free competition. This commission, however, did not prevent the continual increase of prices. The honorable councilor then said:

> When one of the branches of trade, that which serves the public alimentation, is in the hands of eight or ten commissioners, who are at the same time speculators and merchants, who can at their will cause a rise by allowing on the market only the cattle that they wish; who hold in their power a majority of the butchers by the weekly credits which they (the commissioners) grant them, I say that this is no longer liberty, it is monopoly.

The last word seems to be the alarm-cry uttered by everybody in Bordeaux for the last twelve years.

On the 12th of November, 1880, Mr. Olagnier, a municipal councilor, presented a petition by which 4,500 inhabitants, in presence of the excessive prices reached by the butchers' meat in town, claimed the re-estabment of taxed prices; and another member of the council mentioned that for the last twenty years the price of meat had more than doubled.

The consequences to be drawn from all the preceding is that the commissioners monopolize the cattle trade at Bordeaux; that they admit to the market only the small number of animals required to maintain the highest prices; that the cattle-raisers, merchants, and butchers are at their mercy; that the municipality have for years been constantly in search of the means of checking the monopoly; that the public is deprived of the most necessary article of food on account of the small quantity of meat sent to the stalls, and especially of high prices demanded for it.

In presence of such a state of things, my opinion is that the importation of live stock from the United States would prove a paying speculation, as it would meet the most urgent wants of a population of 221,000 inhabitants, consuming yearly 22,000 oxen. If the monopoly was destroyed, and if meat became more abundant and cheaper, this amount would increase 50 per cent.

COST OF INTRODUCING, STABLING, AND FEEDING CATTLE IN BORDEAUX.

The cost of introduction, stabling, keeping, &c., of the imported animals from the day of their arrival to that of their sale to the butcher, is as follows:

Customs dues, per head, $2.89, if imported direct. Town dues, 48¼ cents per 100 pounds' weight. All animals intended to be slaughtered must be sent to the official pens, where it costs for oxen 29 cents per head, and for cows 19 cents per head for the first twenty-four hours, food, litter, and attendance not included. If the owner or purchaser does not provide food, litter, and attendance, these are given *ex officio* by the establishment at the following rates: Nine pounds of hay (half a day's ration), 10 cents; litter, 2 cents; attendance and water, 4 cents. If the animals remain more than twenty-four hours in the pens the charges for each succeeding day are the following: Stabling, oxen or cows, 4 cents per head; food (eighteen pounds of hay, litter, and attendance), 27 cents. When sold, it costs 77 cents per head for slaughter-house dues. This latter charge is at the expense of the butcher or purchaser.

If, instead of live stock, the importations consisted of fresh meat preserved in ice the expenses would be as follows:

	Per 100 pounds.
Customs dues	$0 29
Town dues	96½
Total	1 25½

CATTLE CENSUS OF THE BORDEAUX CONSULAR DISTRICT.

The total number of cattle in this consular district amounts to 656,000 head, viz:

Oxen and bulls	157,500
Cows	330,900
Calves	167,600

With the following proportion of the different breeds:

Garonnais	190,000
Bazadais	32,000
Bordelais	6,000
Limousin	149,100
Pyrenean of various breeds	238,900
Landais	40,000
Total	656,000

GEO. W. ROOSEVELT,
Consul.

UNITED STATES CONSULATE,
Bordeaux, ——— —, 1883.

NORMANDY CATTLE.

REPORT BY CONSUL GLOVER, OF HAVRE.

WORKING CATTLE IN FRANCE.

In some portions of France oxen are still extensively employed in various kinds of work, and particularly on the farm. Many persons contend that for such uses, and in certain localities, they can perform a given amount of work at less expense than horses. To me this seems improbable. Still there may be some kinds of rough ground where oxen can be very advantageously employed. They walk more slowly than horses, and are more even in their gait, so that in "new ground," or in stony lands, they may be very desirable. But it is not necessary to pursue this branch of the subject further, inasmuch as cattle, in the United States, are esteemed chiefly on account of their qualities for the dairy or the butcher. The cow that produces the largest amount of milk and butter—other things being equal—is the best cow, and the bullock that furnishes the most beef of good quality, in the shortest time, is the best ox.

It is not my purpose to attempt a full description of all the various breeds of cattle in France, but to give as complete information as I can in regard to the races in the northern part of the country, and particularly those in Normandy.

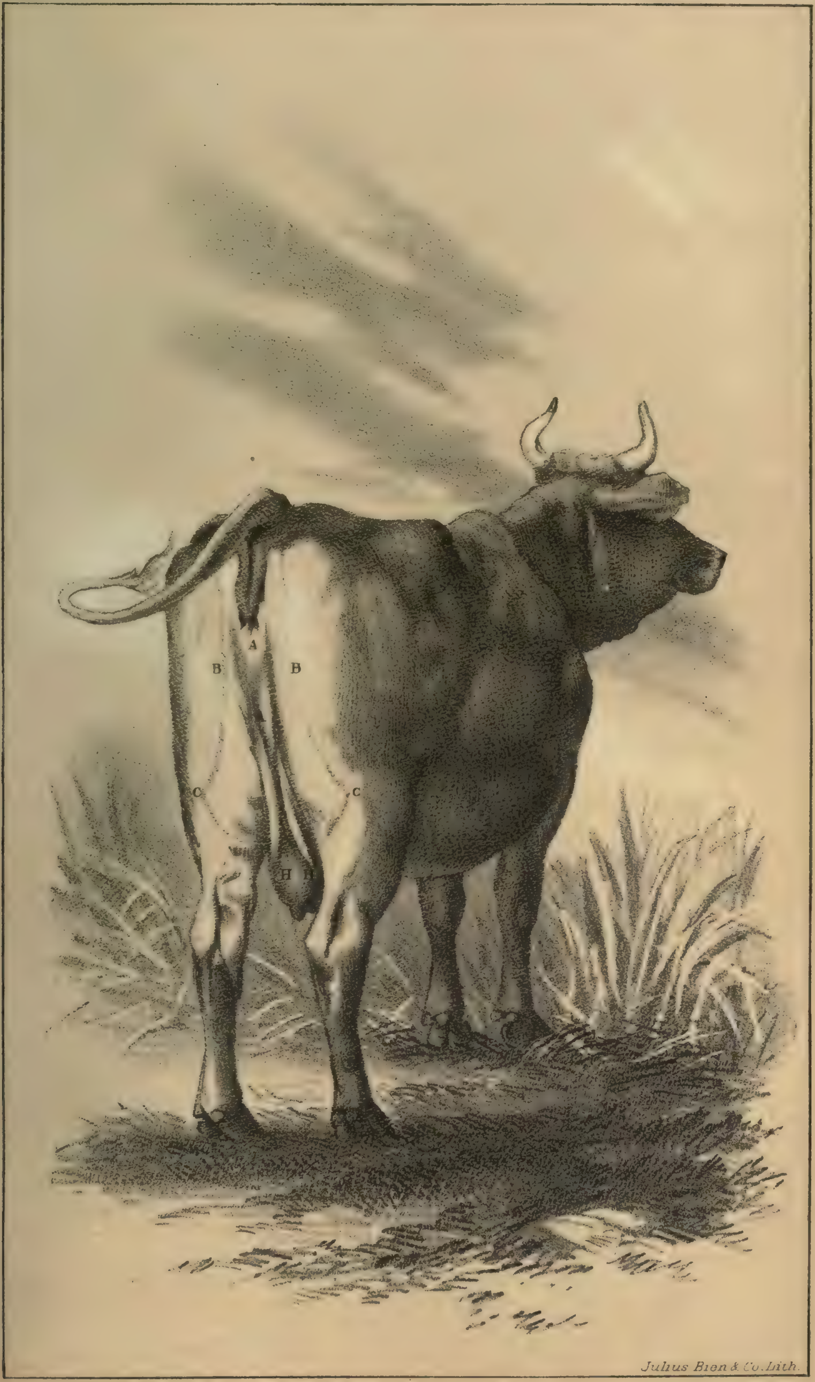
NORMANDY, ITS SITUATION, SOIL, CLIMATE, ETC.

This province is bounded on the north by the English Channel, and lies on both sides of the river Seine. It is composed of five departments, viz: Seine Inférieure, chief cities Rouen and Havre; Eure, chief city Evreux; Calvados, chief city Caen; Manche, chief city St. Lo; Orne, chief city Alençon. Although Normandy is situated between the 49° and 50° north latitude, the climate is temperate. The mercury rarely rises above 75° in summer, and ice is not often formed to exceed half an inch in thickness in winter. Snow scarcely ever falls to any considerable depth, and generally disappears in a few hours at most. Such a climate is well adapted to the raising of cattle. In parts of the province some kinds of grasses remain green the year through. The surface of the country is rather uneven, being intersected by many streams, which flow into the channel. Still much of the "up-land" is of good quality, while the bottom land is wonderfully productive.

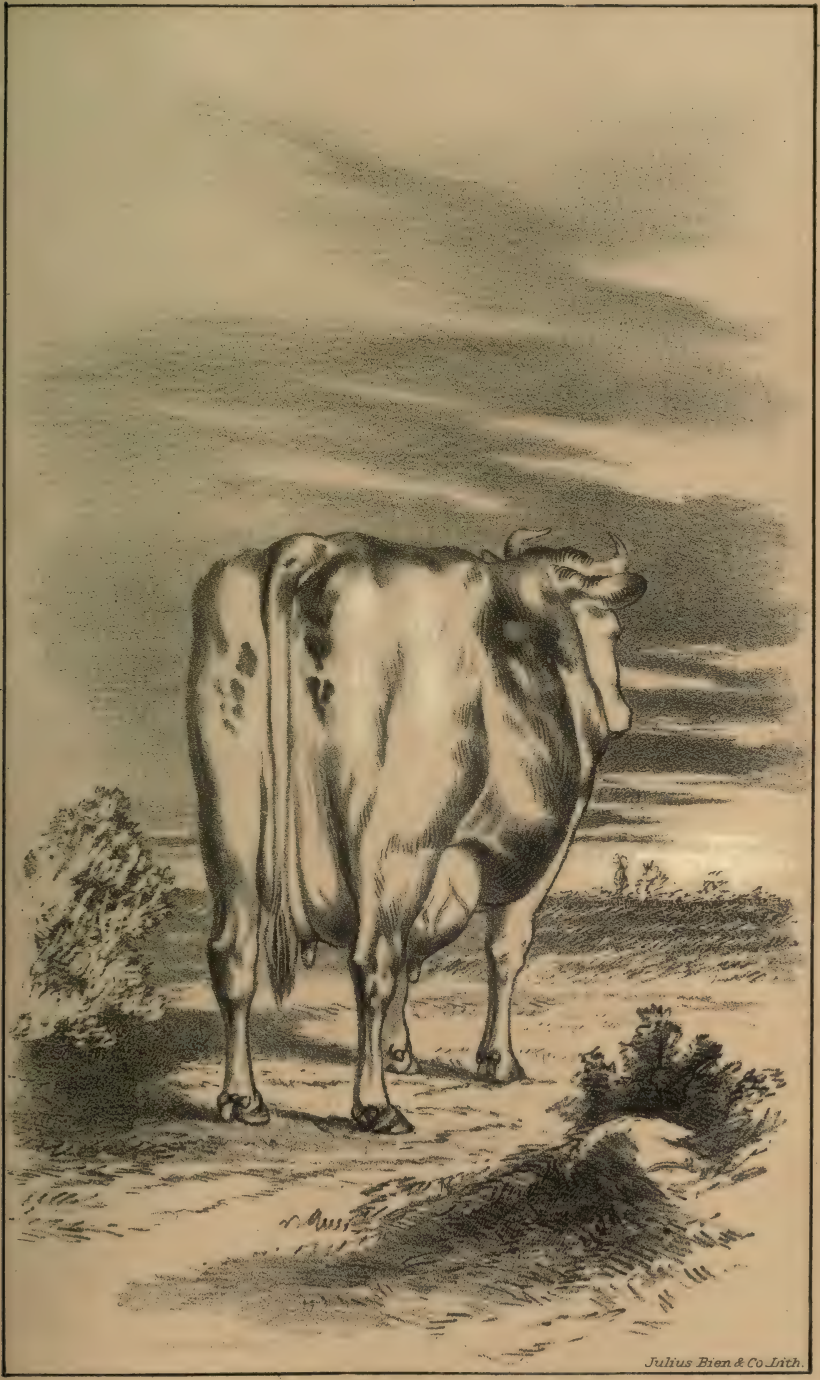
Taken as a whole, Normandy is a very fertile country, but all portions of the province are not equally favorable for cattle raising. The departments of Calvados and the Manche, which lie on the west side of the Seine, are very remarkable for their fine cattle, and especially for butter-producing cows. In these departments are to be found the purest Norman types.

CHARACTERISTICS OF THE NORMAN BREED.

Of the Norman race there are two varieties which are particularly distinguished, viz, the Cotentin and the Augeronne, the former being the more highly esteemed. The following are some of the peculiar characteristics of this race: Size large and often not very handsome,

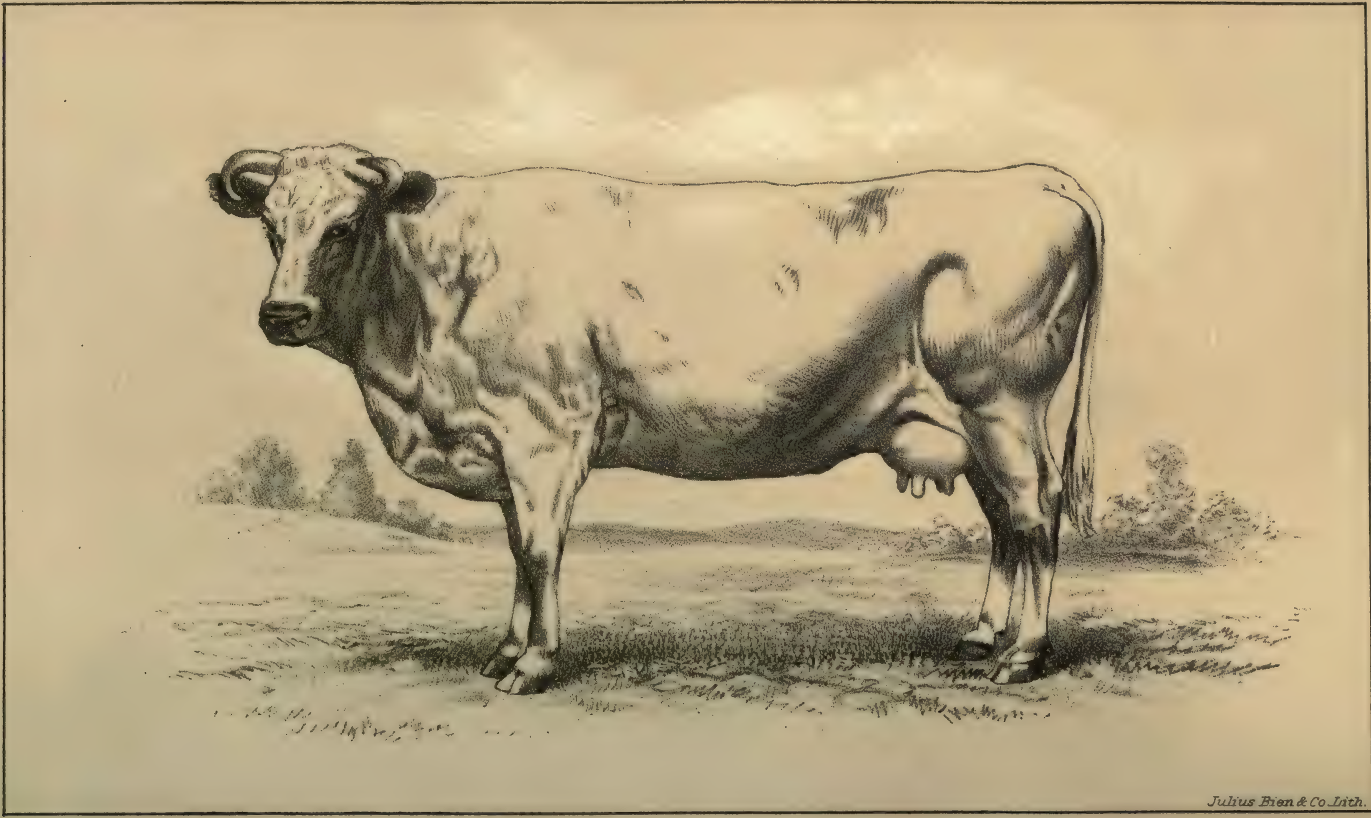


NORMAN COW


Julius Bien & Co Lith.

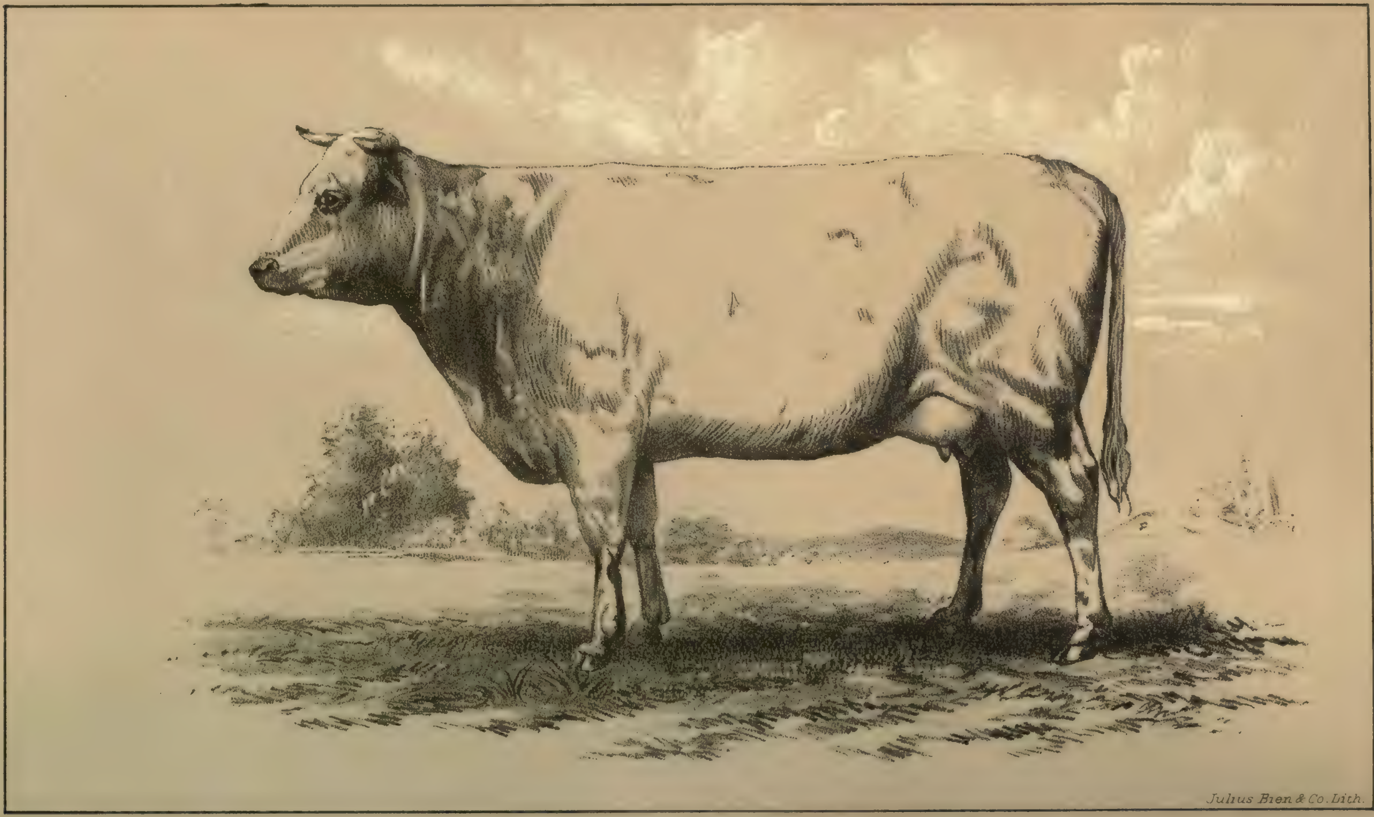
HOLLAND COW

PLATE 124


Julius Bien & Co. Lith.

NORMAN MILCH COW (COTENTINE)

PLATE 125



Julius Bien & Co. Lith.

DURHAM NORMAN COW

large bones, with head rather heavy and long, the mouth large, horns crumpled and white as ivory. They are of many colors, but most of them are what we would call "brindle cows." I inclose a cut, which will aid in forming a just estimate of their form and general appearance. In my judgment, there are few better cows for dairy purposes to be found in any country than this Cotentin variety.

THE NORMAN CATTLE PREFERABLE TO THE JERSEYS OR ALDERNEYS.

The very best cows of this breed are to be found between Caen and Lisieux, where they are sometimes called "*vaches de pays*," that is to say, cows of the country. I am of opinion that some of these Norman cows could be imported into the United States and advantageously crossed with certain American breeds. They are most excellent milkers, of good disposition, and their milk is both abundant and rich. All things considered, they are certainly to be preferred to the English Jerseys or Alderneys.

NORMANDY BUTTER.

Probably no other country in the world, of like size, produces more good butter than the department of Calvados. Small villages in this region export to Paris large quantities of butter annually. The town of Isigny alone sends nearly 6,000,000 pounds every year. Gournay also sends 3,000,000 pounds.

FRESH VS. SALTED BUTTER.

We always have the Calvados butter on our own table, and find it excellent. The French do not use salt in butter, which seems rather strange to an American, but I am inclined to think that our people use too much salt in butter, as well as in many other articles of food.

MILKING QUALITIES OF THE NORMAN COW.

An ordinary Norman cow will give about 20 quarts of milk per day, while in some cases extra fine ones have been known to give 36 quarts in the same length of time.

I think it will be safe to say that an average Cotentin cow will produce 40 pounds of butter per month. This butter is probably worth in Paris 50 cents per pound the year through.

The accompanying cuts will give a better idea of the shape and general characteristics of this breed than any written description I could possibly give.

This race is sometimes crossed with the Durham, which certainly improves the appearance of the stock; but many of the French people believe, that for dairy purposes, the Cotentin cows cannot be improved by the admixture of any other blood.

However, there are those who contend that such crossing does not decrease the quantity or the quality of the milk. Some of these young Durham-Norman cows with the first calf have been known to give more than 20 quarts of good milk per day.

FEEDING AND HOUSING CATTLE IN NORMANDY.

In summer these milch cows feed on various kinds of grasses, including red clover. They do not run at large, as is the custom in the United States, but they are staked out in rows, across the fields, and can only graze to the end of their tether. After they have eaten everything within reach they are moved to a new position. This process requires a little more care than we are accustomed to, but it is very important to economize in every way in a country where land is so valuable. In winter they are fed on hay, beets, turnips, carrots, cabbage, &c. A good cow is worth about $75.

NORMAN BEEF CATTLE.

The Norman race is esteemed for the *boucherie*, but I am sure that it is greatly improved by crossing with the Durham stock.

The half breeds mature more rapidly, are larger, and of better form than the pure Norman. Bullocks for the market are chiefly fattened in the summer on the excellent pastures which abound in this province, and especially in Calvados and the Manche. This part of France produces abundance of beef for home consumption, and bullocks have been sometimes exported, principally to England.

The upland has a clayey, marly soil, and is well adapted to the various grasses. In the hilly regions we find abundance of flint, but the soil is quite productive.

VALUE OF BEEF AND BEEF CATTLE IN NORMANDY.

A good bullock on foot is worth about $130. Fine specimens will sometimes sell for $200 or more; but such animals are not often sold in this market. Beef cattle are worth about 10 cents per pound, on foot. This with the addition of octroi and other taxes, of course makes our sirloin steaks rather high priced. For choice cuts from extra fine bullocks we sometimes pay from 36 to 40 cents per pound. Good beef can be had, however, at from 24 to 30 cents per pound.

FRENCH VS. AMERICAN BUTCHERS AND BUTCHER SHOPS.

The French butchers handle their meats with the greatest possible care. I think our American dealers might learn something from the French in this regard. As a rule they are more careful in their selections of animals for the *boucherie*, and the result is that the beef is more uniformly good. Their shops are perfect models of neatness, and always as clean as they can possibly be made; cleanliness is next to godliness, especially in the dairy and the butcher shop. The French butchers allow their meats to hang much longer before cutting than our American butchers. I note this custom from the fact that I think it greatly improves the texture of the meat. Our American housekeepers ought to be a little more sparing in the use of salt. A new steak, well salted before broiling, is almost sure to be tough.

FRENCH VEAL.

It is not the custom in France to slaughter very young calves. They are rarely killed before they are three or four months old, and many of these weigh from 140 to 200 pounds net. *Veau* is always to be found in the markets, and is greatly esteemed by the French people.

IMPORTATION OF AMERICAN CATTLE INTO HAVRE.

Very few, if any, American cattle have been imported into this part of France. The chief difficulty in regard to the business is cost of transportation. Can this obstacle be removed? is the question. It would seem that powerful and swift steamers specially arranged for the trade ought to be able to carry beef cattle at such a rate as would leave a profit for the dealer. A Calvados bullock, weighing 1,500 pounds, is worth in this market about $145. A like animal in Galveston, Tex., would probably be worth about $60. This would leave a margin of $85 for transportation, shrinkage, profits, &c.

This does not appear sufficient to induce capitalists to engage in the trade. Still I am of opinion that the time is coming when Europe must receive a large part of her beef cattle direct from the United States.

We have an unlimited quantity of the very best beef in the world, and a large portion of it ought to find its way into the mouths of the hungry millions on this side of the Atlantic.

I think, however, as indicated above, that freights must be considerably reduced before our live bullocks can be shipped at a profit from the Great West to any of the French ports. But the time will come.

EXPORTATION OF NORMAN CATTLE TO THE UNITED STATES.

So far as exportations from this country to the United States are concerned, it is not probable that they will ever be very large. A few choice Norman cows, strictly for breeding purposes, will be all that can be expected in this direction.

Accompanying this report will be found cuts of the various French breeds, especially those of the Northern part of France. These will be useful in comparing the different races, showing their form, &c.

JOHN B. GLOVER,
Consul.

UNITED STATES CONSULATE,
Havre, November, 1883.

CATTLE PRODUCTS IN THE DISTRICT OF THE MARNE.

REPORT BY CONSUL FRISBIE, OF RHEIMS.

I have the honor to acknowledge the receipt of Department's circular dated July 18, 1883, requesting information relative to cattle breeding, for the use and benefit of the stock breeders of the United States.

Immediately on receipt of said circular I began an investigation of the subject presented, with the hope that I should be able to prepare a report of some interest and benefit to the Department and to the stock breeders of the country; but in this I am sorry to say that I have not been successful, from the fact that the material out of which to make such a report does not exist in this district.

This condition arises from the fact, first, that the soil is light and chalky, and not suitable for growing grasses for pasturage, thus rendering stock-raising unprofitable; and, second, in the champagne district, of which Rheims is the center, the great industries are the cultivation of the vine and the manufacture of its product, and the manufacture of woolen goods, which leave little room for other enterprises of a less profitable nature.

So far as I am informed, there does not exist a single cattle market in this district. Beef is brought to this market already killed and dressed, from Paris and other places at a distance. Butter for table use is brought from Normandy and other places, while the little which is made in this vicinity is fit only for cooking purposes.

Milk is largely brought to this market by rail from out-lying districts, that which is produced in the vicinity of Rheims being of an inferior quality.

JOHN L. FRISBIE,
Consul.

UNITED STATES CONSULATE,
Rheims, France, October 18, 1883.

CATTLE IN THE DISTRICT OF NICE.

REPORT BY VICE-CONSUL VIAL.

The ordinary breed, Taurus, is the single one to be found in the district of Nice. Neither beeves nor bulls are bred or fed in this part of France; cows alone receive the best care in the dairy for milk purposes, inasmuch as the milk is the chief food of a great many foreigners coming here during the winter. The beeves arriving in this town from Piedmont (Italy) are all reserved for the butcher. The best cow, the preferred, is called "Bergamase." This name refers to the town from which it is drawn, viz, Bergamus (Italy). It is a very stark cow, thick-set, dark chestnut, fine-haired, 4 feet high, always hollow-backed, with two large veins near the paps, one on each flank; giving an average daily quantity of 3 or 4 gallons of excellent milk. When wanting cows, the milkmen of Nice get the Bergamases from Lombardy (Mouza, Milan, Bergamus), and they choose them in the third year of their age, having just had their first calf or being still in calf. As Nice is surrounded by hills and as there are no large plains or meadows the plow is quite useless, and consequently no labor is required from oxen or cows. The best milkmen estimate that there are from 2,000 to 2,500 cows in the district of Nice. When bought in Lombardy a cow costs $80 to $90, but its transportation to Nice raises this cost to $85 or $95. Cows are conveyed hither by railway express, in wagons containing seven or eight. Six gallons of water and 18 pounds hay are their daily food in a journey of eighteen hours. The same ratio of food would be sufficient for the passage across the Atlantic, provided they be kept in appropriate stalls, 6 feet wide, 6 feet high, and 9 feet long. The daily food of a dairy cow is estimated at 44 cents.

No exportation takes place from Nice; the cattle crossing over this country is directed to a few small towns of the department of the Alpes Maritimes. They are generally driven on foot, unless long distances require railway express. From time to time Nice receives beeves for butchery either from Sardinia or from Algeria (Africa), but in small quantity and only when the importations from Italy become very scarce. Such animals give, however, but a middling quality of meat which can hardly be sold on the market, where the Piedmont cattle meat is always preferred.

A. VIAL,
Vice-Consul.

UNITED STATES CONSULATE, *Nice, October* 16, 1883.

SWITZERLAND.

SWISS CATTLE.

REPORT BY CONSUL MASON, OF BASLE.

THE TWO PRINCIPAL RACES AND THEIR SUBSIDIARY BREEDS.

Switzerland, whose seventeen different kinds of cheese are nearly all exported, in greater or less quantities, to most civilized countries, possesses two distinct and noble breeds of cattle, each of which may be fairly said to be, in respect to certain essential qualities, unsurpassed, if indeed they are equaled, by any other bovine races in Europe. They are, respectively:

(1) *The Spotted race* (Fleckvieh), which has its origin in the valleys of the Simme, the Saane, and the Kander in Canton Berne, and is known by the name of "Berner spotted," or "Simmenthal or Saanenthal cattle." The principal off-shoot or subsidiary breed of this race is the "Freiburger Schwarzvieh," from the adjacent canton of Friburgh, which is marked similarly to the Berners cattle, except that its spots are black instead of yellow or red.

(2) *The Brown Schwyzer race,* the origin of which is traced to Canton Schwyz, from which its name is also derived. This race is bred in its greatest purity in the central cantons of Schwyz, Uri, and Zug, and is distributed throughout the whole of Appenzell, Eastern and Central Switzerland, and as far west as the Canton of Argau. A few are also kept in the high valleys of the Jura and among the adjacent foot-hills, so that this breed must be included in any adequate account of the cattle of this consular district.

As to the approximate date at which these two principal races of cattle were first introduced into Switzerland, opinions differ. By many their presence here is believed to be coexistent with that of the present race of people, and there have been found among the remains of the prehistoric lake-dwellers skulls of oxen bearing horns and other marks peculiar to the brown Schwyzer cattle of to-day. It is generally believed that the Spotted breed of cattle, on the other hand, was derived originally from the Netherlands, and a resemblance is found between the Bernese animals and certain breed of Dutch cattle. But, whatever their origin, the essential fact is that the Spotted and Brown cattle races of Switzerland have been refined and improved by many centuries of careful treatment and intelligent breeding, and have become during the modern period of international expositions two of the most valued and important breeds in Europe.

SWISS IMPORTS AND EXPORTS OF CATTLE.

By reason of the limited area of this thickly peopled country, and the high values of its meadow and pasture lands, the cattle product of Switzerland is inadequate to its needs, and the animals which are annually imported for meat exceed in number, though not in value, the Swiss cattle which are exported in constantly increasing quantities for dairy and breeding purposes. There were in Switzerland, at the last census, 1,036,000 horned cattle, of which about one-half were milch cows.

The statistics of 1883 are not yet at hand, but the exports and imports of horned stock for 1881 and 1882 were, respectively, as follows:

IMPORTS.

From France	44,515
From Germany	42,768
From Austria	20,135
From Italy	3,082
Total neat cattle	110,500
Calves, all countries	1,159
Total for 1881	111,659
Total for 1882	116,000

EXPORTS.

To France	13,181
To Germany	20,188
To Austria	4,004
To Italy	19,865
Total	66,338
Calves	9,861
Total for 1881	76,199
Total for 1882	76,000

There were exported during 1881 and 1882 a few choice Brown cattle to the United States for breeding purposes, but as they were shipped via Antwerp, and therefore crossed the Swiss frontier into Germany, they are probably included in the registered exports from that country.

The beef cattle which are now imported into Switzerland from Germany, Austria, and Italy are mostly large, raw-boned, and rather coarse-looking animals, rough-haired, long-horned, and wanting in most of the essential points of highly bred stock.

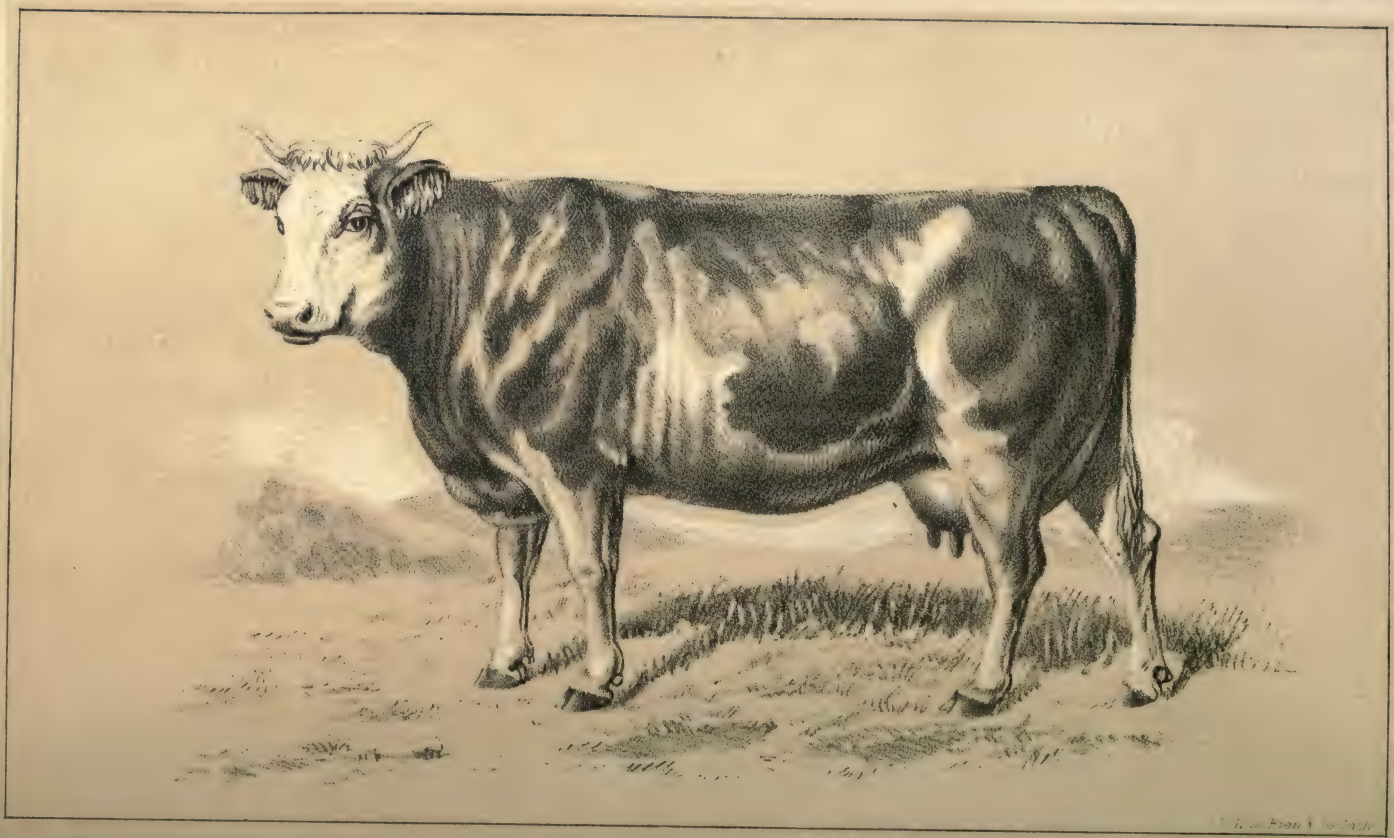
PRICES AND EXPORTS OF CHOICE SWISS CATTLE.

The export of fine dairy and breeding cattle from Switzerland to adjacent countries, as well as to England and the United States, is increasing so rapidly that prices have advanced largely during the past two years. At a cattle fair in Sargans early in October of this year, I was told that the sales showed an average advance of 50 francs per head for all classes, as compared with values a year ago.

As early as August buyers from Italy and other countries appear in force in the mountain districts, and many of the choicest animals are picked up by them before the cantonal fairs of September and October begin, and it is claimed by good authorities that this increasing popularity of Swiss cattle in foreign countries and the growing practice of selling the milk from many dairy farms directly to large milk-condensing establishments is having a pernicious effect upon the cattle and the people of the rural cantons. On the one hand, the sale and export of so many of the choicest animals tends naturally to check the improvement of the stock; while, on the other hand, the daily sale of milk for a liberal cash price tempts the thrifty Switzer to work for immediate results rather than use part of his daily milk product in raising calves.

So that while the outflow of fine stock to other countries is increasing, the supply of such animals has not increased in due proportion.

PLATE 127



SIMMENTHAL COW

that these cows average 21 pounds of milk daily, or 7,665 pounds each during the year. This is a maximum record for an entire herd, and requires liberal winter feeding on grain, roots, &c., which is rarely practiced by the rural farmer. It will also be noted that these cows are stabled throughout the year, and, except during a few days in October, after the last grass is cut, they never graze.

The records of several well-conducted dairies in the wide basin between the Jura and Bernese Alps, where three hundred milking days are counted to each year, show an average yield of 23 pounds 14 ounces of milk per day from each cow, or 7,162 pounds for the year. These statistics have been carefully collected, confirmed, and published by Mr. B. Baumgartner, member of the cantonal council of Soleure, and president of the agricultural association, whose long and intelligent labors for the improvement of Swiss stock and the general advancement of agricultural interests make him a high and recognized authority on such subjects.

In richness of milk, the Spotted race also ranks well. In the Alps, where the grass is savory and richest, 25 pounds of their milk yield a pound of butter; in the valleys, the quantity required for the same purpose varies from 28 to 30 pounds. Ten pounds of milk yield a pound of cured cheese, and besides this, in mountain dairies the herdsmen usually skim enough cream to make 1 pound of butter from each 100 pounds of milk without sensibly affecting the quality of the cheese. This so-called "Vorbruch butter" has, however, a strong animal flavor, and sells usually for 2 or 3 cents per pound less than ordinary butter from the same district. Something, of course, depends upon the quantity and the quality of grass upon which the animals are fed, but the above figures may be accepted as standard for well-bred Bernese cows kept on farms where meadows are manured, and irrigated in dry weather.

THE BERNESE (SIMMENTHAL) AS BEEF CATTLE.

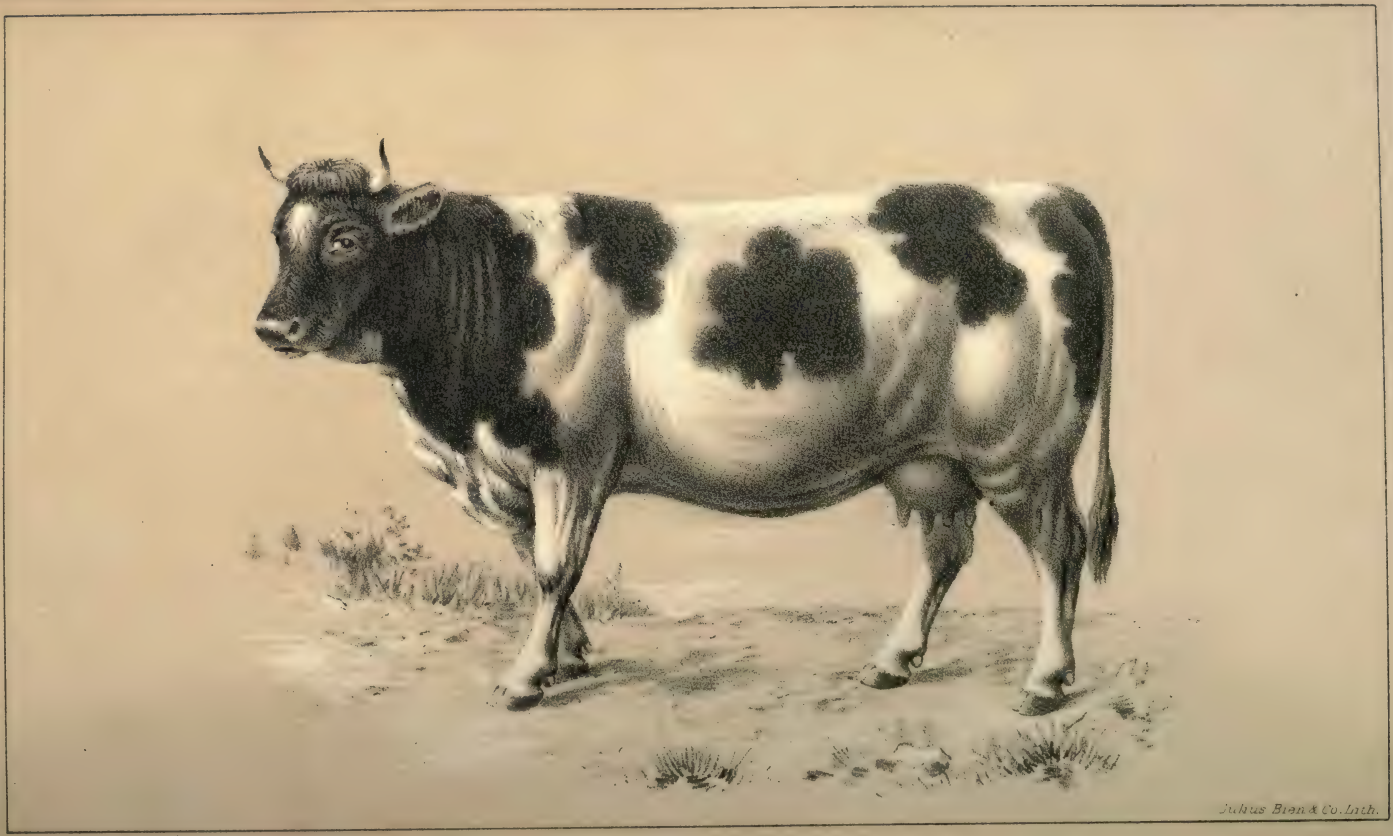
As beef cattle it will be accurately inferred from the foregoing that the Bernese race holds the first place among the breeds of this country. They grow rapidly and are mature in their fourth year. They are of enormous size, compactly and cleanly built, and their flesh is fine-grained, tender, and savory. As such it is readily distinguishable, either in the butcher's stall or at table, from the coarse-grained, stringy beef which is produced by most of the imported "scrub" cattle with which Switzerland supplies the deficit in her meat product. Finer beef than is produced here from the stall-fed Simmenthal oxen I have never seen, either in England or the United States, and it may well be doubted whether better exists anywhere.

PRICES OF FINELY BRED BERNESE CATTLE.

The present market values of finely bred Bernese cattle, such as would naturally be selected for export, are indicated by averages of sales at several fairs during the present autumn, as follows: Calves, six months old, $40; yearlings, $80 to $100; cow (four to five years old), $130 to $145; bull (two to four years old), $130 to $150.

A competent buyer, familiar with Swiss dialects and methods of "dickering," could go among the farmers and buy equally good cattle at perhaps 10 per cent. less than the above prices, which are the values current among dealers.

PLATE 109

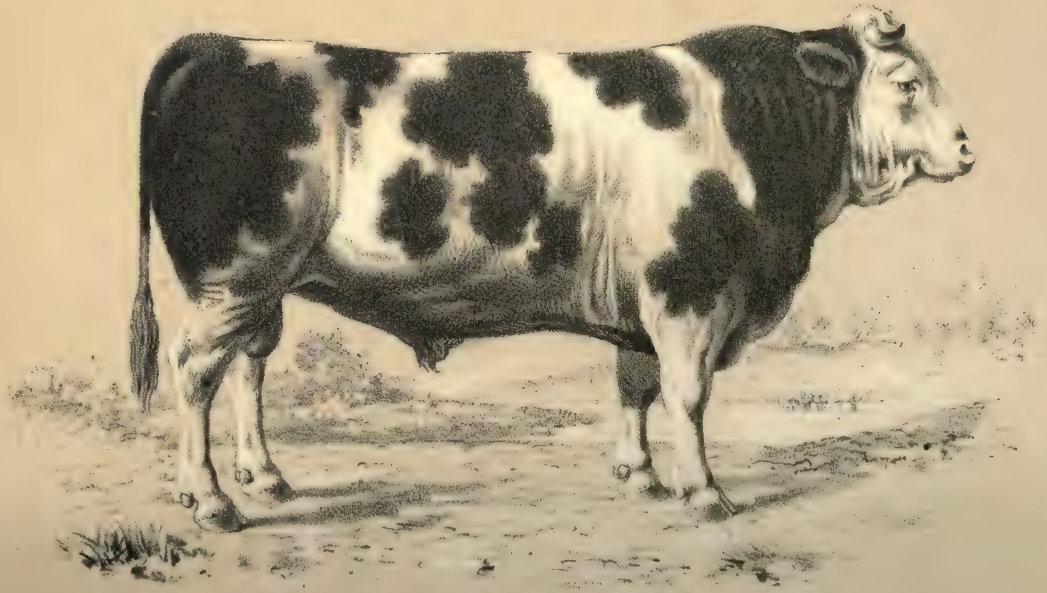


Julius Bien & Co. Lith.

BLACK FREIBURG COW

AGRICULTURAL
LIBRARY,
UNIVERSITY
—OF—
CALIFORNIA.

PLATE 128



Julius Bien & Co. Lith.

FREIBURG BLACK SPOTTED BULL

BERNESE CATTLE SUITABLE FOR EXPORT TO THE UNITED STATES.

For export to the United States, the six-months-old calves are recommended by experts here as being cheaper at first cost, easier and less costly to transport, and more likely to acclimatize readily than older animals.

BLACK-SPOTTED FREIBURG CATTLE.

There are several off-shoot breeds derived from the pure Bernese, known as the Freiburg, the Frutiger, the Illiez, and Ormond breeds, but they are all more or less inferior to the pure original race. As a principle, cross-breeding has failed in Switzerland, and the best results have always been obtained by in-breeding from the pure original stock.

Of these minor spotted breeds the only one which deserves notice here is the Freiburg, which originated in the canton of that name, and is still bred there in great purity, although even there it is gradually giving way in the best herds to the light-colored Saanen and Simmenthal variety.

The distinctive mark of the Freiburg cattle is found in the fact that their spots are black. Many examples are seen in which the entire animal is black, except perhaps the head and a stripe under the belly. It is fully as heavy as its Bernese rival, but has larger, heavier bones, coarser flesh, and is in other respects inferior to it in the technical points which characterize a perfect stock.

As working animals and as milkers the Freiburgers rank next to the Bernese, but for reasons stated they are less valuable for either the home market or export.

SIZE OF BERNESE AND FREIBURG CATTLE AT MATURITY.

Thoroughbred animals of both Bernese and Freiburg breeds attain at maturity the following dimensions: Length, 83 to 87 inches; height of shoulder, 55 to 60 inches; girth behind shoulders, 87 to 99 inches; weight, 1,600 to 2,500 pounds.

THE BERNESE—DURHAM CROSS-BREED.

For meat-producing purposes, a cross between the Swiss-spotted cattle and the English-Durham breed has been found excellent, but it is inferior for dairy and working purposes to the pure bred Simmenthaler and is comparatively little known.

BROWN SCHWYTZER CATTLE.

As already indicated, the one other breed of Swiss cattle which challenges the supremacy of the Fleck race is the Brown Schwytzer, which has been bred for many centuries in the cantons of Schwytz, Uri, and Zug, and has spread thence throughout the whole mountain region of Switzerland. Its renown as a milker, its gentle disposition, and its ready adaptation to varying conditions of food and climate, have made the Schwytzer the better known, as it is no doubt the more largely exported of the two pure breeds of Swiss cattle.

As milkers.—The milk-producing records of choice herds of these cows have been carefully kept for centuries by the monks at Einsiedeln, and later at the milk-condensing establishment in Cham, both of which will be so fully reported by the consul at Zürich that they may be omitted here.

DESCRIPTION OF THE BROWN SCHWYTZER CATTLE.

The Schwytzer cattle vary greatly in size. Some are nearly as large as the average animals of the spotted race, but there are other varieties which are kept in the high alpine districts, and which do not average more than 1,000 pounds in weight.

The standard Schwytzer cow has, however, a weight of 1,200 to 1,300 pounds, and is a remarkably perfect animal. The color most highly esteemed, as indicative of pure blood, is a dun or mouse-color, fading to gray upon the back, and a strip of light gray or nearly white along the belly. The udder should be white, with large lacteal veins, the horns white two-thirds of their length, with tips of black. The ears are large and round, lined inside with long, fine fawn-colored hair; the tongue and nose are black, the latter ringed with a circlet of light-colored hair, approaching nearly to whiteness on the lower jaw. The body is plump and compact, the back straight, the legs round, firmly set, and well muscled, with small black hoofs. The mountain-bred Schwytzer cattle climb like goats, and thrive throughout the year upon grass and hay alone.

These cattle have been exported to the United States and to all European countries, including even Russia; and they have proved entirely successful everywhere except in Spain. They work well under the yoke, but are smaller and less powerful than the spotted race, and for the same reasons they are likewise inferior to that race for the butcher. They are, in fact, bred principally for their milking qualities, and in that respect they are unsurpassed in the quantity and quality of milk which they produce from a given quantity of food.

MILKING QUALITIES OF THE SCHWYTZER CATTLE.

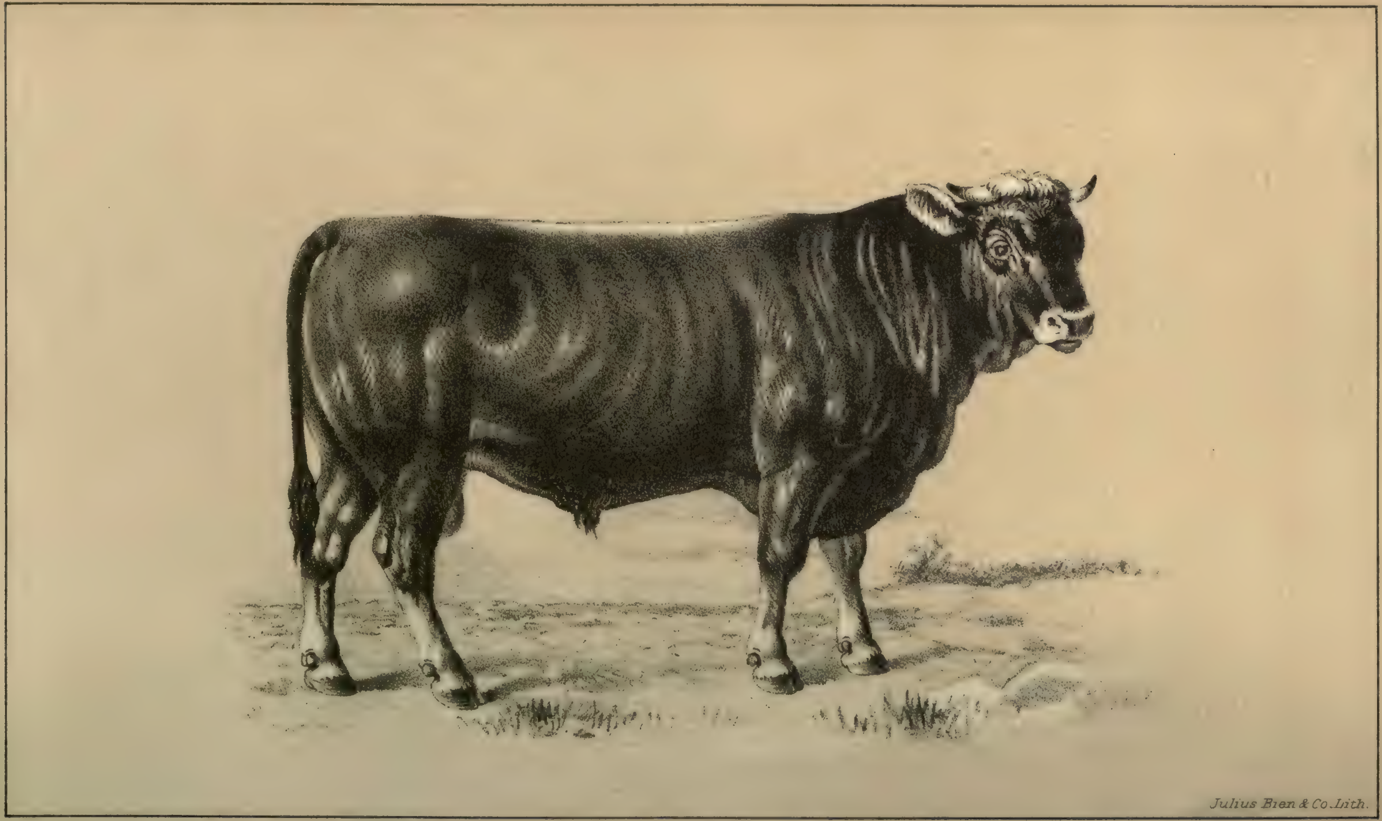
Trustworthy statistics show that a well-kept Schwytzer cow, fed on cut grass or hay, with plentiful pure fresh water, will yield an average of 10 quarts of milk daily during the entire year. At Cham, the 6,000 cows, whose milk is condensed by the Anglo-Swiss Company, yield 5,315 pounds, or $9\frac{8}{10}$ quarts each per day during the milking season, and these are only ordinary animals of the brown Schwytzer race. Choice herds, carefully kept, average at the best milking age, during April, May, and June, 12 quarts daily and even higher. The milk is of excellent quality, from 25 to 30 quarts of it yielding a pound of butter, and from 9 to 10 quarts a pound of cheese.

PRICES OF BROWN SCHWYTZER CATTLE.

Comparisons of sales at several fairs in Eastern Switzerland during the present autumn show the following prices for well-bred brown cattle of various ages:

Calves, six months old		$40
Yearlings	$80 to	100
Two-year olds	100	120
Cows, four to six years old	120	140
Bulls, three years old	120	150
Old cows	60	100

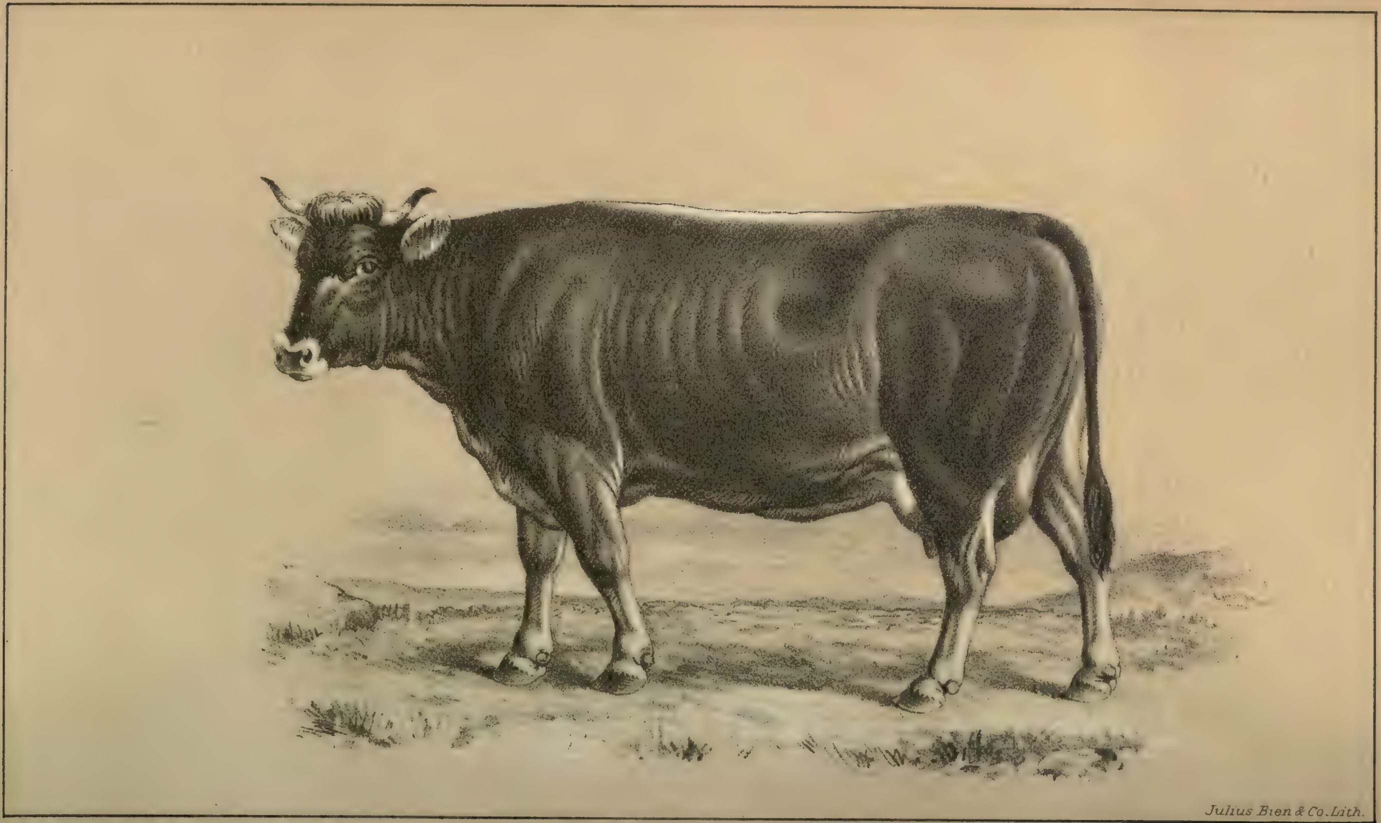
The prices charged by peasants at their farms would be 10 per cent. less than these figures.



Julius Bien & Co. Lith.

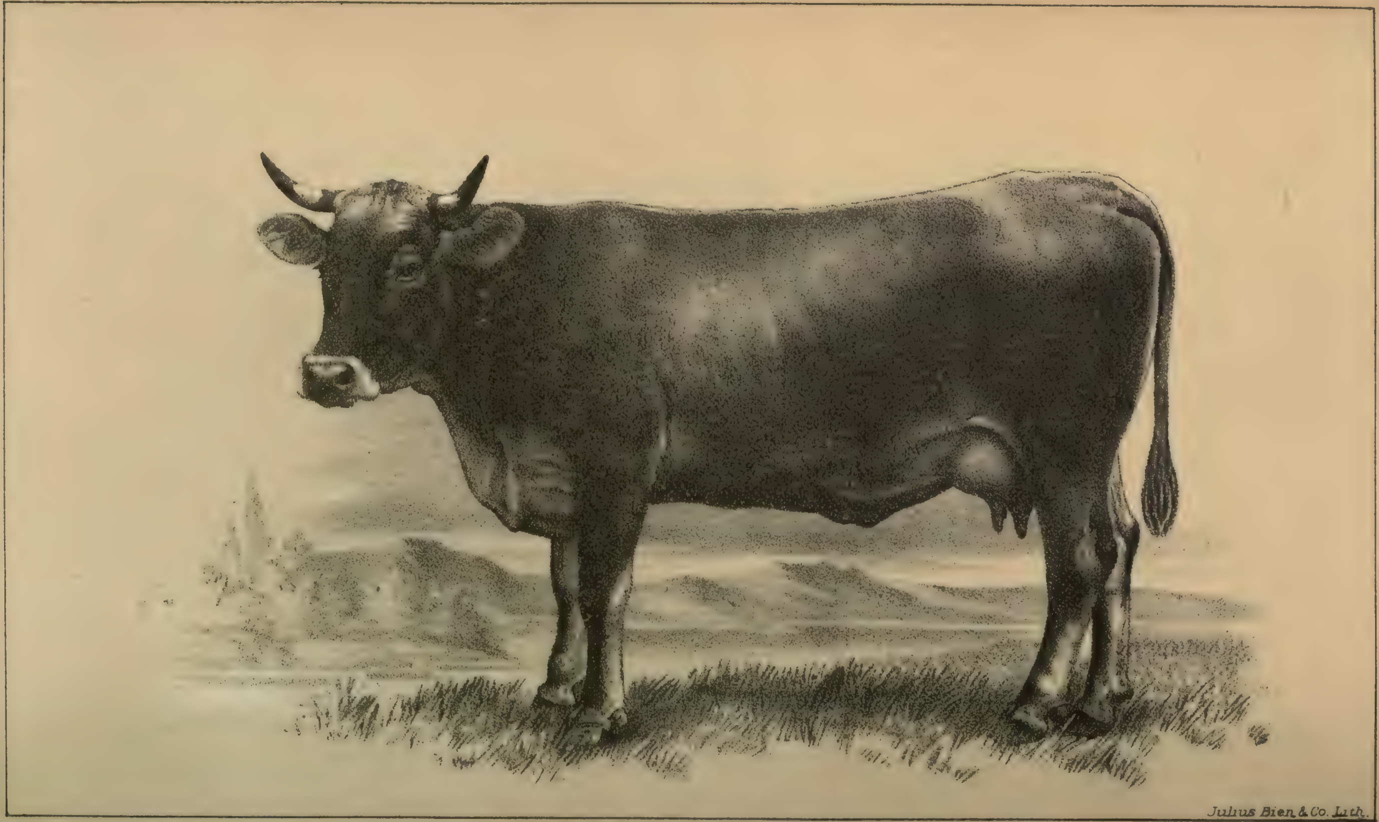
BROWN SCHWYZER BULL

PLATE 131



Julius Bien & Co. Lith.

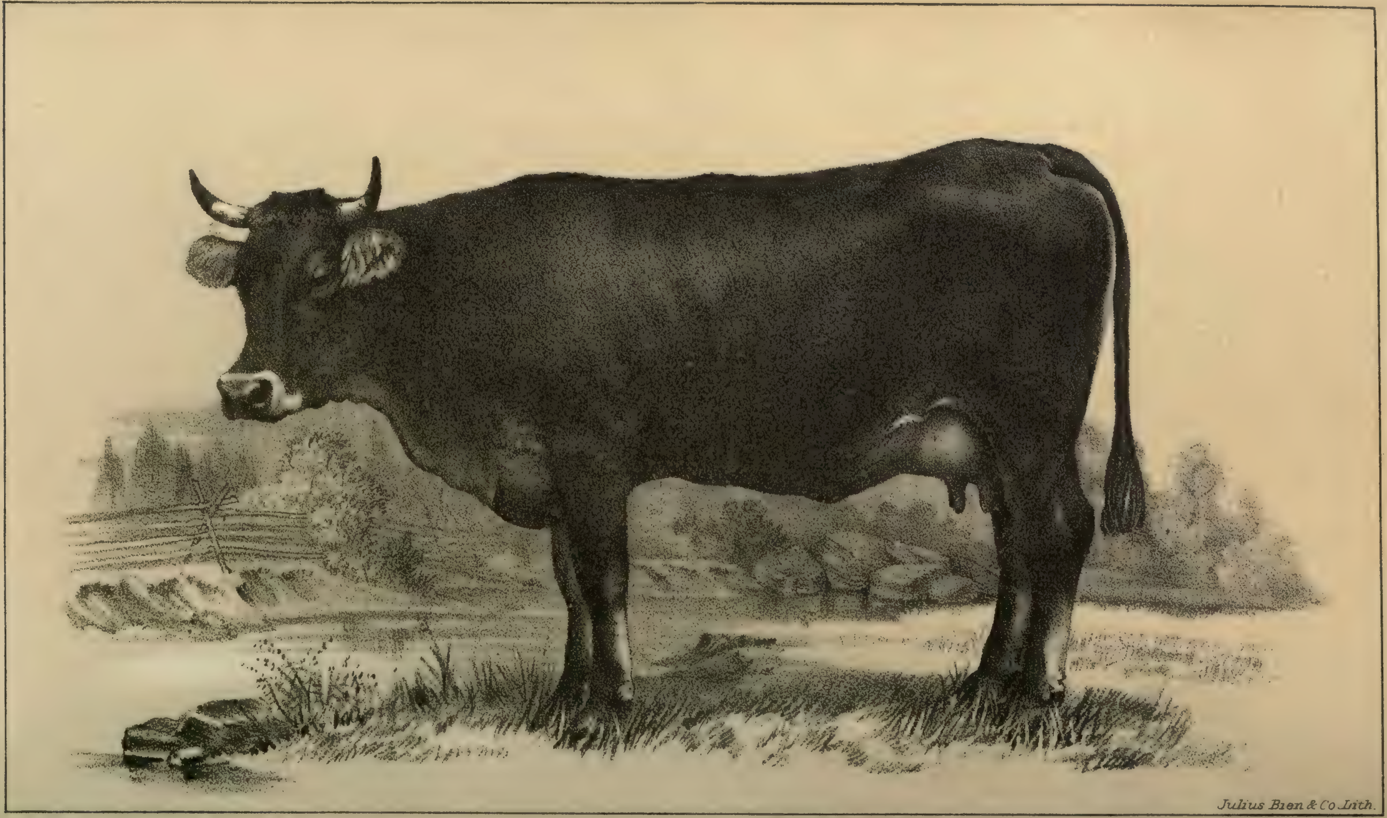
BROWN SCHWYZER COW



Julius Bien & Co. Lith.

BROWN SCHWYZER COW.

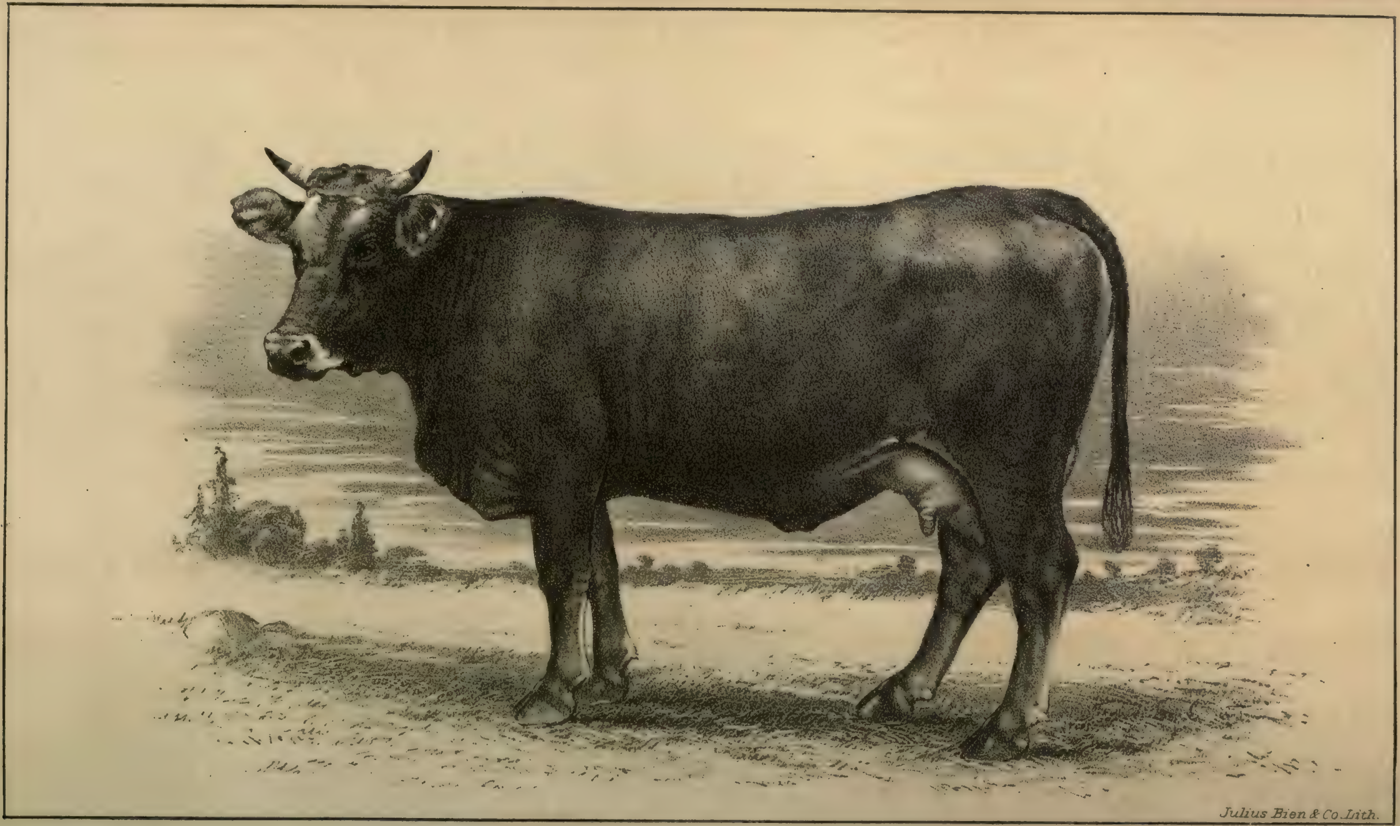
SECOND PRIZE AT THE SWISS NATIONAL EXHIBITION of 1883 PURE TYPE, SHOWING THE GRADATIONS OF COLOR



Julius Bien & Co Lith.

BROWN SCHWYZER COW.

TRUE TYPE 1ST PRIZE FEDERAL EXHIBITIONS OF 1881 & 1883. WEIGHT 1500 LBS. POSITION IN PHOTOGRAPH IS BAD
OWNER HAS REFUSED AN OFFER OF $400 FOR THIS COW.

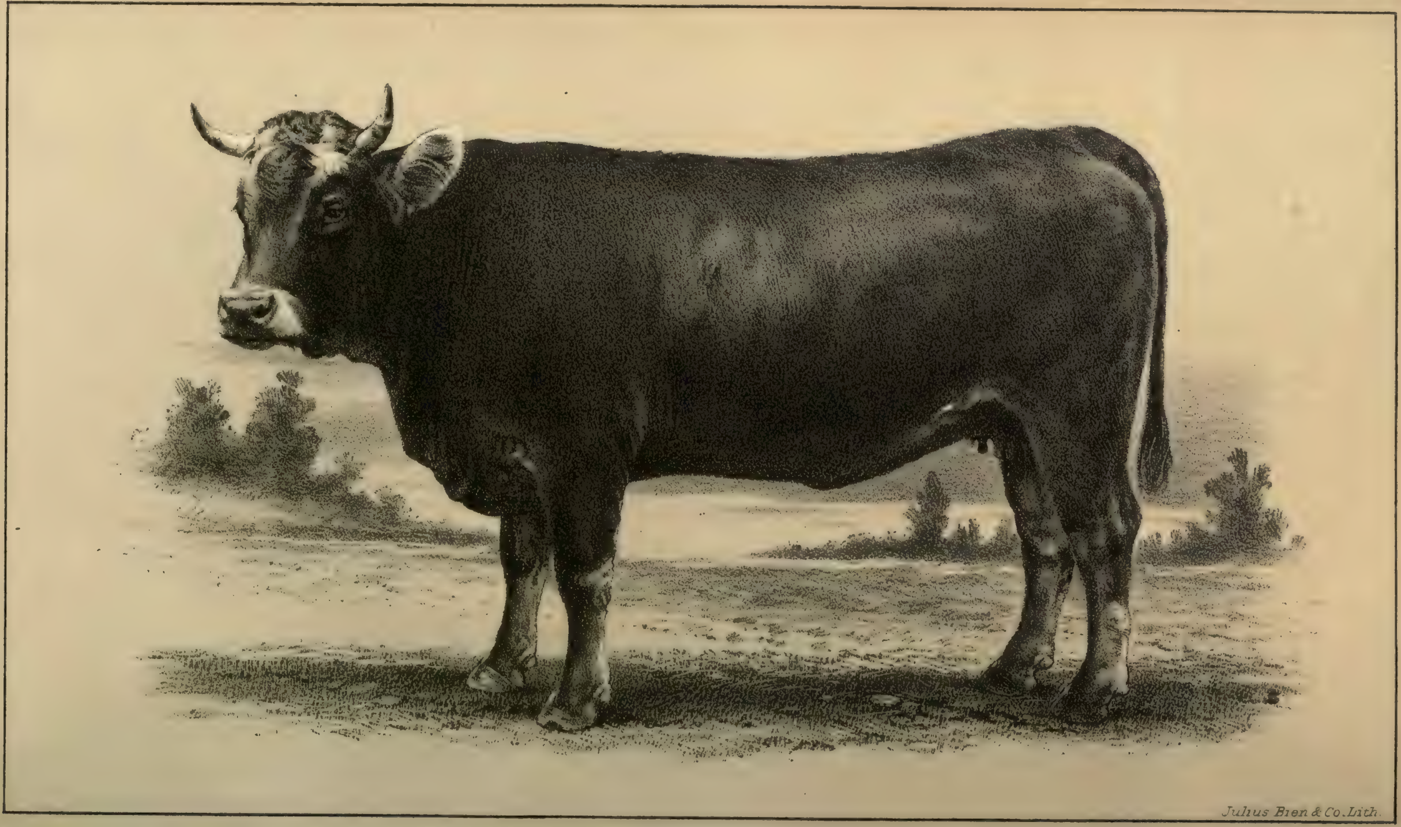


Julius Bien & Co. Lith.

BROWN SCHWYZER HEIFER.

3 YEARS OLD, JUST BEFORE FIRST CALF. TRUE TYPE OF PURE BLOOD.

THIRD PRIZE IN CLASS OF COWS FEDERAL EXHIBITION OF 188

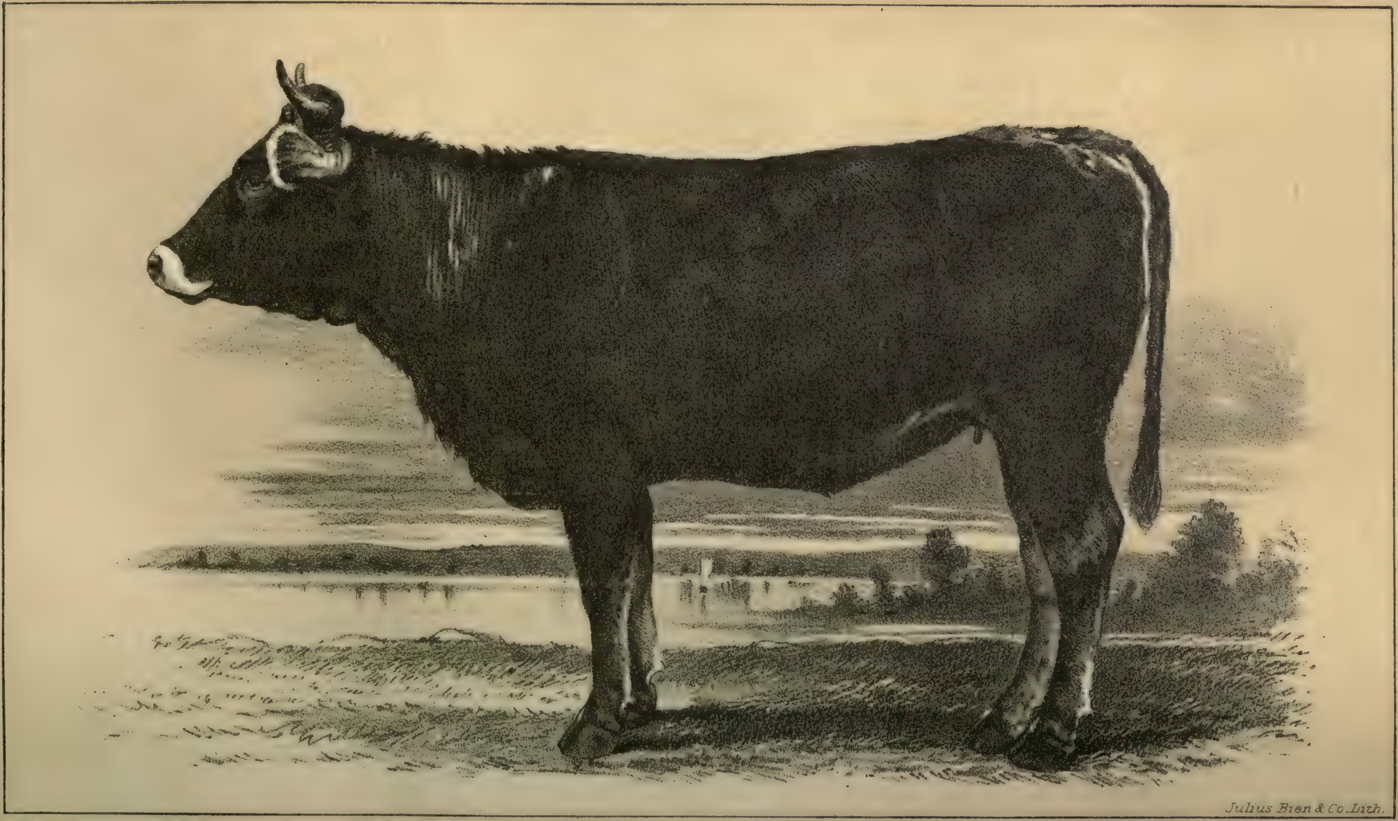


Julius Bien & Co. Lith.

BROWN SCHWYZER HEIFER.

TRUE TYPE 3 YEARS OLD, BEFORE FIRST CALF PURCHASED FOR \$ 242^{00}

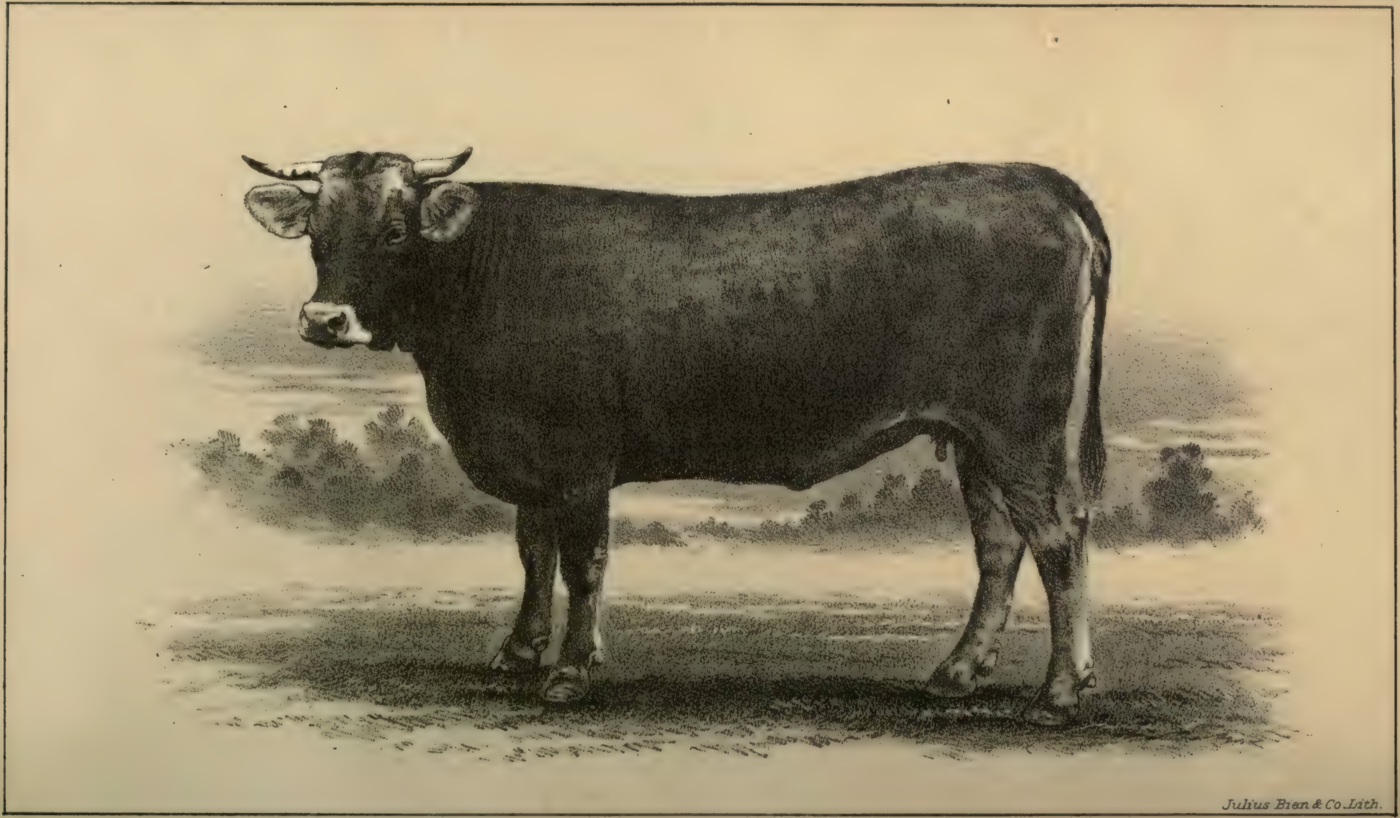
PLATE 137



Julius Bien & Co. Lith.

BROWN SCHWYZER HEIFER.

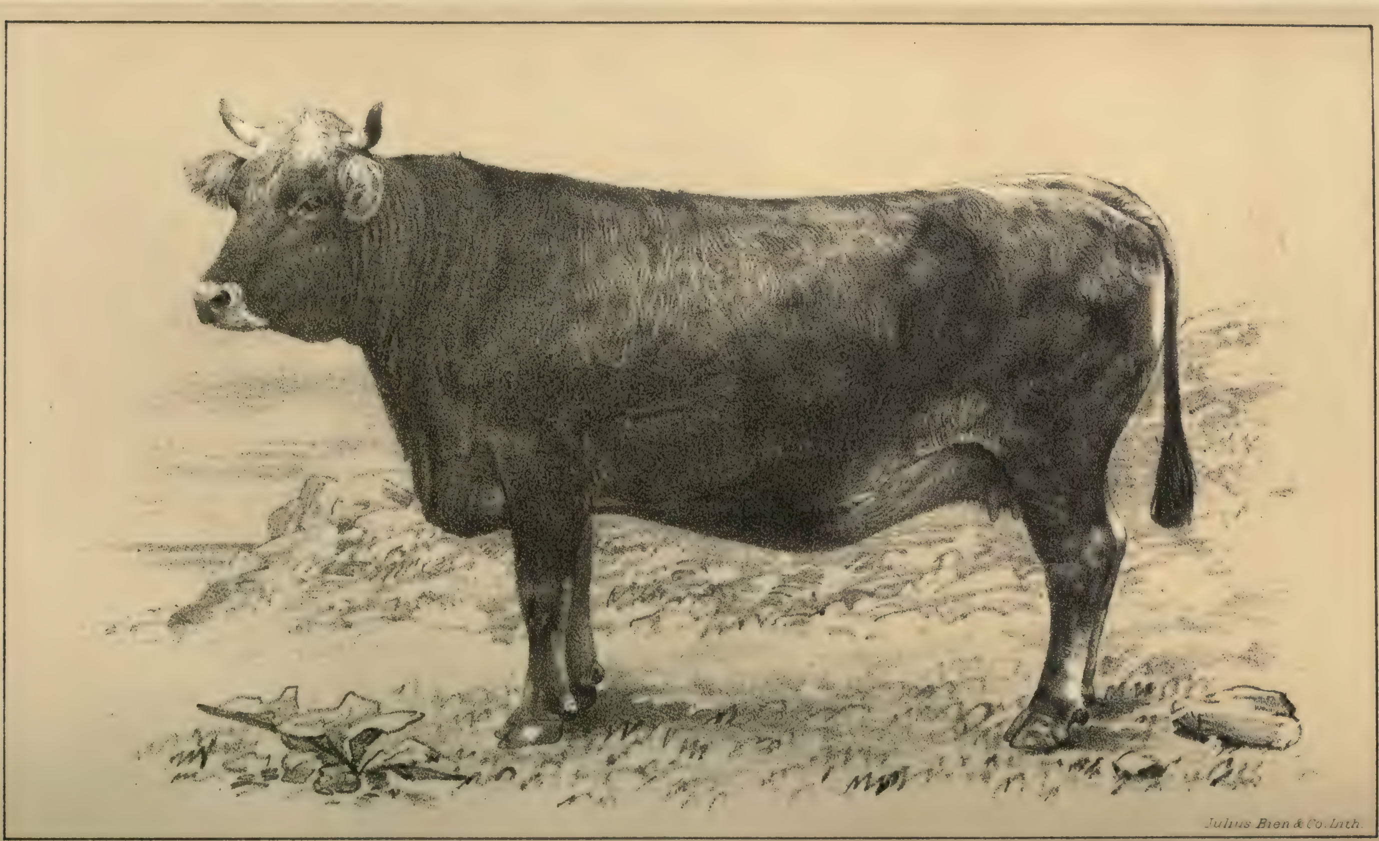
PLATE 138



Julius Bien & Co. Lith.

BROWN SCHWYZER HEIFER.

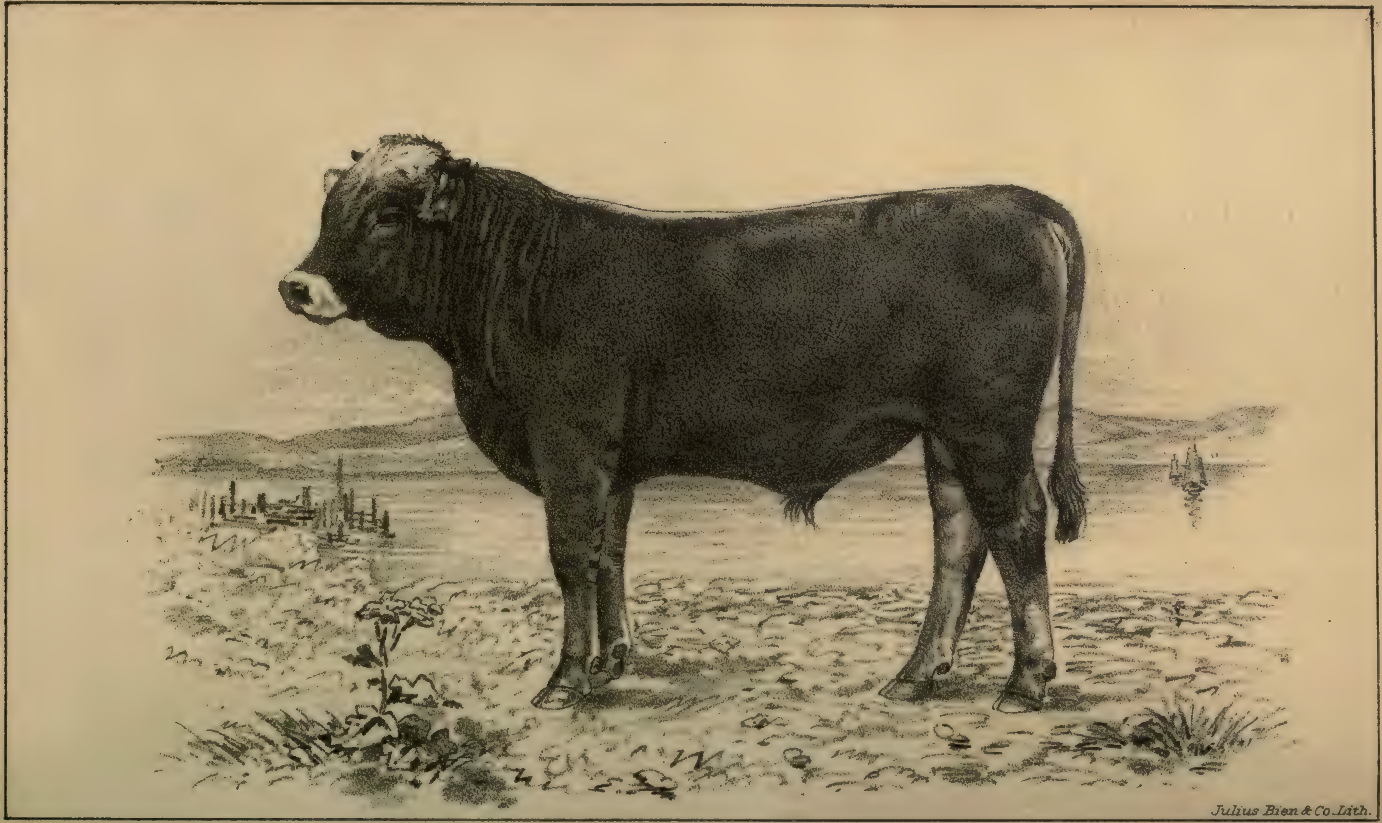
3 YEARS OLD, BEFORE FIRST CALF. FAIR TYPE ONLY. HORNS NOT WELL SET AND RATHER LARGE, AND DROOP MORE THAN THE STANDARD TYPE OF THIS RACE.


Julius Bien & Co. Lith.

SWISS BROWN COW.

VARIATION FROM THE TRUE TYPE, FARROW OR NOT IN MILK, 4 YEARS OLD
WEIGHT IN CONDITION HERE SEEN 1186 POUNDS

PLATE 140



Julius Bien & Co. Lith.

BROWN SCHWIZER BULL

TRUE TYPE _14 MONTHS OLD; FIRST PRIZE, CANTONAL EXHIBITION OF 1882
THIRD PRIZE, FEDERAL SWISS EXHIBITION OF 1883.

BERNESE AND BROWN SCHWYTZER BREEDS.

The collection of official photographs which accompanies this report exhibits first-prize cattle of the Bernese, Freiburg, and brown Schwytzer breeds at the national exhibition held at Luzern in 1881. These pictures represent in sufficient variety the most perfect specimens of the two races, and will fully justify and confirm the high estimate in which the pure-bred Swiss cattle are held by stock-breeders of all countries. As to which race is best for transplanting to the United States, experience only can determine, for even in Switzerland the palm of superiority between the two is still in dispute.

The dairymen at Appenzell, the clever monks at Einsiedeln, and Mr. George Page, the capable American manager of the Anglo-Swiss Condensed Milk Company, prefer the brown race.

President Baumgartner, whose experience and observation include many choice herds of both races in various cantons, as well as the famous dairymen of the Emmenthal, and a number of cantonal governments which have made elaborate experiments upon farms attached to public institutions, all these unquestionable authorities prefer decidedly the spotted race.

In respect to size, the merits of two races will be accurately shown by the following figures, which represent the average measurement of the premium cattle at a recent fair in Langenthal. The figures given are the mean result derived by measurements of from eleven to twenty-eight animals in each class:

Animals.	Height of shoulder.	Girth behind shoulders.	Length.
Bulls:	*Inches.*	*Inches.*	*Inches.*
Bernese spotted	53½	79½	82
Brown Schwytzer	51½	75½	77½
Cows:			
Bernese spotted	55	81	84
Brown Schwytzer	52	77	80
Heifers before milking age:			
Bernese spotted	52½	77½	81
Brown Schwytzer	49½	72	77

Length in these measurements means from the base of horns to the root of the tail.

HOW SWISS CATTLE ARE HERDED, HOUSED, AND FED.

It has been stated in former reports from this consulate that dairying and cattle-growing are each year becoming more important in Switzerland and supply a constantly increasing percentage of the gross income which is earned by the agricultural population. The reasons for this are:

First. By reason of uncertain seasons the small percentage of arable land in this country and its consequent high value, added to the competition of cheap breadstuffs from Hungary, Russia, and the United States have made wheat-raising much less profitable than dairying and stock-growing.

Second. The present improved methods which prevail in the Swiss cattle industry enable the farmer to utilize every rood of accessible soil from the rich valleys to the highest pastures of the Alps and Jura, and the industrious care which he devotes to the feeding and raising of cattle enable him to realize the largest financial result from the smallest area of salable land.

The Swiss have not only two distinct breeds of the finest and most economically valuable cattle in the world, but they probably surpass every other people in the unwearying care and intelligent economy with which their animals are housed, milked, and fed.

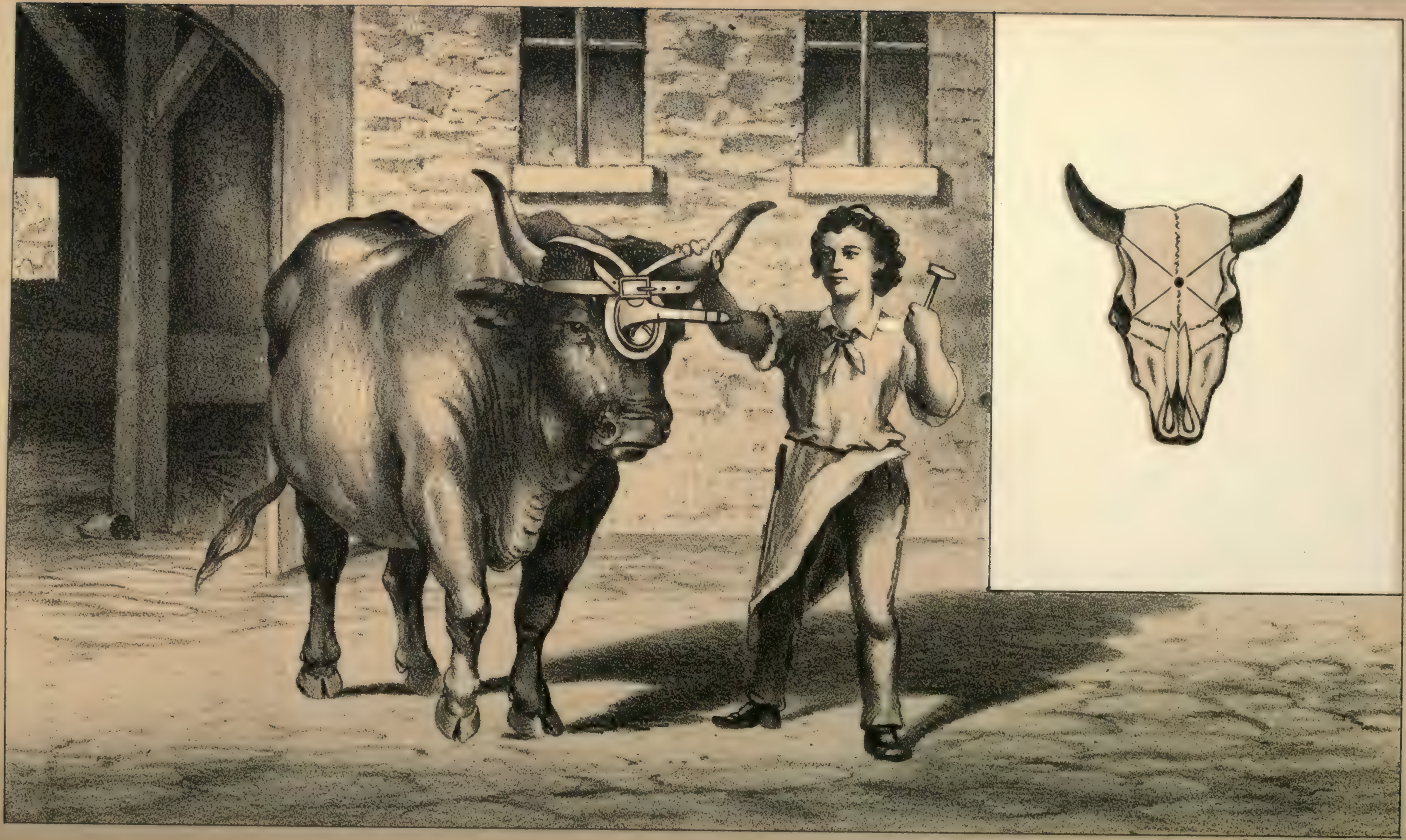
Whether the farmer of the lowlands lives in a village or upon his land his dwelling and his stable are usually under the same roof. Great, roomy, and homely, but picturesque, structures they are, those houses and barns, covered by the same steep and projecting roof of red tiles, under the spreading eaves of which are stored the wagons and other farm machinery when out of use. That end of this building which shelters the family may be of wood, with picturesque balconies and exterior stairways; the upper part of the other half in which the hay is stored is not unfrequently built of squared pine logs or clapboarded, with large and frequent openings for ventilation of the hay, which is cut and thrown in fresh and fragrant, often almost without curing, in this rainy, cloudy climate, but the stable, that chief feature of the establishment, which underlies the hay-loft, is invariably built of stone, its solid walls of masonry being often 2 feet in thickness and plastered within and without. The heavy oaken stable-door fits into its casings like the cork of a bottle; the ceiling is as nearly air-tight as possible, and one or two small openings through the thick wall admit only a feeble glimmer of light to the dim interior. The floor is of plank or stone with a sunken section through the middle to catch the wet and waste, and heavy mangers or troughs along the sides receive the food of the cattle. The stables, for the most part often cleansed and kept with all practicable neatness, are almost entirely unventilated. In such stalls, in a close, noisome atmosphere, the cows on most lowland farms are kept day and night throughout the year except during a few days in late September and October, when, after the last crop of grass is mowed, the herd is turned out for a fortnight or two of grazing. This practice, however, is by no means universal among the dairymen of the valleys, many of whom never bring their cows out of the stable from one year to another, except, perhaps, for a few moments, when they are led to the adjacent trough to be watered.

Whatever else he may believe the Swiss cattle-grower never forgets that the prime requisites of economical dairying and meat growing are warmth, quiet, good, plentiful food, and fresh water for the animals, for warmth saves food.

A cow housed in a close, warm, dark stable wastes none of the fat or milk-producing elements of her food in needless exertion. She is protected from flies, from the goring and annoyance of other cattle, from the hot sun of noon and the chills of rain and dews as well as from the sudden flaws of bleak wind which even in midsummer blow at times from the snow-clad slopes of the higher Alps.

There are, of course, throughout the whole mountain region of Switzerland high valleys and steep pastures to which the cattle are driven in May or June and graze until the end of the brief summer. But even there the same zealous and intelligent care is taken to protect the animals from every contingency of weather. The chalets on the lofty meadows, which look so picturesque from the valleys below, are, for the most part, cow-houses built of squared logs or planks carefully chinked with clay or moss, and constructed, like the barns for winter, in the most careful and substantial manner. I have counted nine layers or thicknesses of shaved pine shingles in the roofs of these chalets, so carefully are they constructed to exclude the damp and cold. There is often a fireplace between the stalls at the end opposite the door, and there the mountain

PLATE 132



Julius Bien & Co. Lith.

herdsman lives and sleeps with his cows from spring until autumn. If the morning is fair and the sun warm he turns them out to graze upon the short, sweet mountain grass, and busies himself with mowing and bringing in a supply that will serve to sustain his herd during night or stormy weather; but at the first approach of cold wind or rain his *jodel*, or his horn, is heard and the cows hasten to their accustomed shelter. Naturally purely blooded cattle treated in this way, curried and brushed daily like well-kept horses, trained to be led and handled, always cared for, and never beaten or abused, have become in the course of generations perfectly domesticated. If the American stock-growers, who are now seeking to import Swiss cattle for breeding purposes, will only import Swiss herdsmen to take care of them the result cannot fail to be valuable in more than one respect. Even the fat oxen on their way to the shambles are led in pairs like horses, and instead of being jammed into crowded cars, mauled through the streets to noisome, muddy stockyards and abattoirs, they are carefully and humanely treated until the last moment of their lives.

THE SWISS SYSTEM OF SLAUGHTERING.

The arrangement for slaughtering cattle in the city of Basle is so perfect that a brief allusion to it may be pertinent to the object of this report.

On the Rhine bank, below the city, is a large, newly-constructed abattoir, built by the city government and placed under the care of Director Siegmund, an accomplished veterinary surgeon, who inspects all animals before they are allowed to be slaughtered, and controls all the processes of preparing the meat for market.

Dr. Siegmund has invented and put in use at this establishment perhaps the most perfect and merciful instrument yet constructed for killing cattle.

It consists of a mask or plate of iron, which fits the forehead of the animal, and is readily attached by straps which are fastened round the horns. In the center of the mask is fixed a steel gun, 10 inches long and of about .38 caliber, the breech being outward and provided with a steel needle, which, on being struck with a small hammer, explodes the ordinary metallic cartridge with which it is loaded. The barrel is fixed at such an angle to the interior surface of the mask that the bullet pierces the center of the brain and is buried in the spinal marrow, producing instantaneous and painless death. With tame, quiet cattle, a form of this implement is used which is not bound to the head, but simply applied to the forehead and fired. In either case the result is the same. The ox walks without fear or apprehension to the shambles, a touch is given to the fatal needle, and the huge creature drops, utterly dead and incapable of suffering. The bleeding afterwards is perfect, and thus the only excuse that can be decently urged for killing cattle by long and painful methods is met and overcome.

Compare this instantaneous process with the barbarous methods in use elsewhere, of pounding cattle on the head with a sledge or swinging them up alive by a hind leg to bellow and struggle until they bleed to death.

MEAT PRODUCT OF VARIOUS CATTLE.

The following interesting statistics, which were collected for this purpose at the Basle abattoir, will show the origin and live and dressed weight of a number of cattle recently slaughtered there, together with the weight of hide, tallow, and percentage of dressed to live weight in the case of each animal:

Nativity.	Hide.	Tallow.	Live weight.	Dressed weight.	Percentage of dressed weight.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	
Austria	128	190	1,820	1,020	56
Do	127	114	1,518	864	57
Do	94	126	1,330	849	64
Do	102	146	1,394	827	59
Italy (Piedmont)	101	152	1,670	919	55
Do	99	130	1,422	800	56
France	85	88	1,250	741	59
Do	106	60	1,250	756	60
Do	106	100	1,570	902	57
Switzerland	124	60	1,550	922	59
Do	103	95	1,440	875	61
Do	117	56	1,324	862	65
Do	110	68	1,346	796	59
Do	112	65	1,340	818	61
Do	145	90	1,400	855	61

From statistics furnished to Mr. Page, superintendent of the Anglo-Swiss Condensed Milk Company at Cham, it appears that the average weight of dressed meat derived from oxen of the Brown Schwytzer race is 850 pounds. An ox of this race weighing alive 1,650 pounds should yield 880 pounds of salable meat, or 53 per cent. of the live weight. Swiss cattle, particularly of the Brown race, are rarely *thoroughly* fattened, and many of the animals sent to the butcher are discarded cows.

ARTIFICIAL FEEDING.

The subject of artificial feeding is too elaborate and unsettled to be fully discussed in this report, and the materials used here differ so greatly from those used in the United States that this comparison loses much of its practical importance. By far the greater number of Swiss farmers feed nothing but cut grass and hay at all seasons.

Artificial feeding, of course, increases the quantity of milk, particularly in winter, but most Swiss assert that it injures its quality.

THE FEEDING OF CALVES.

In the raising of calves the best approved method recommends, as the daily portion of food, 3 liters (quarts) of milk during the first week, 4½ quarts daily during the second week, 6 quarts during the third week, 7½ during the fourth, and thence to the eleventh week 9 quarts per day. During the fourth week the use of corn or oat meal is begun; also oats in the kernel, commencing with a half pound per day, which is gradually increased to a daily portion of 1½ pounds of corn or oat meal, and also the same quantity of oats and a like weight of dry hay, and this regimen is maintained until the calves are six months old, when they may be treated as adult cattle.

TRANSPORTATION OF SWISS CATTLE TO THE UNITED STATES.

Live cattle are not generally regarded as really desirable freight on the first-class passenger steamships, and the rates charged by them for such transportation are high. The North German Lloyd line charges $100 per head from Bremen to New York, and $80 per head from Bremen to Baltimore. These rates include food and water for the animals during the voyage. The Bordelaise steamship line charges $80 per head from Bordeaux to New York. But the White Cross steamship line offers the following rates for live cattle from Antwerp to New York or Boston: Adult cattle, per head, $39; yearlings, $34; calves, $30.

These charges include also food and water for the animals during the voyage, and free passage for the necessary men in charge of them. If the cattle are unattended, an extra charge of $1 per head is made for feeding and care during the passage. A car-load of cattle from Basle to Antwerp costs about $55, and as a car will carry from ten to twelve head of ordinary sized cows, the net cost of transportation from here to New York or Boston can be very closely estimated.

The importation of fine breeding cattle is, of course, expensive under even the most favorable conditions, but the economic advantages of establishing the Brown and Spotted cattle races of Switzerland in the United States would seem to be so obvious as to fully justify whatever expenditure such enterprise may involve.

FRANK H. MASON,
Consul.

UNITED STATES CONSULATE,
Basle, November 22, 1883.

SWISS CATTLE STATISTICS.

[Inclosures in Consul Mason's (Basle) report.]

Bernese Spotted (Saanen Simmenthal) breed.

Description.	Bernese Spotted.	Brown Schwytzer.
Annual average product of milk .... pounds..	7,162 to 7,665	7,000 to 7,454
Quantity of milk to 1 pound of butter .... do....	26 to 30	29½
Quantity of milk to 1 pound of cheese .... do....	9½ to 10	10½
Dimensions of cow:		
Length .... inches..	84	80
Height .... do....	55	54
Dimensions of bull:		
Length .... do....	86	78
Height .... do....	56	54
Weight at maturity:		
Cow .... pounds..	1,400 to 1,700	1,200 to 1,500
Bulls and oxen .... do....	2,000 to 2,500	1,400 to 1,800
Age at maturity:		
Cows and bulls .... years..	4	4
Oxen .... do....	5	5

Principal markets: Cantons of Uri, Schwytz, and Zug.

Habitat.—Central and Western Switzerland.

Color.—Bernese Spotted: White, with light red, yellow, or dark-red spots. *Brown Schwytzer:* Brown or mouse color; bulls darker, same color.

How long bred pure.—Bernese Spotted: Many centuries. *Brown Schwytzer:* Since before authentic history.

Origin.—Bernese Spotted: Possibly Holland, but the race has been refined and improved in Switzerland. *Brown Schwytzer:* Canton Schwytz, Switzerland.

Working qualities.—Bernese Spotted: The best working race of cattle in Switzerland; believed to be unsurpassed in Europe. *Brown Schwytzer:* Works well in yoke, but is not bred for that purpose.

Principal markets.—Bernese Spotted: Erlenbach, Saanen, Zweisimmen. *Brown Schwytzer:* Cantons of the Schwytz and Zug.

Other varieties.—The Frieburg breed is similar to the Bernese Spotted, but has black spots. Minor breeds of Spotted Swiss are (1) Frutig Adelboden; color, red and white; principal market, Reichenbach, Canton Bern; (2) Walliser, smaller, varied colors.

STATISTICS OF BROWN SCHWYTZER CATTLE.

REPORT BY CONSUL BYERS, OF ZURICH.

In compliance with the Department's circular of July 18, I transmit tabular statements as to certain Swiss cattle best suited for importation and breeding in the United States.

In addition to these tables, I wish to offer some remarks that may be of interest to cattle breeders who are intent on securing only the very best breeds of milch cows.

First, I would like to call attention to my report on "Swiss dairy thrift," printed in No. 22, of Consular Reports; also to my report on "Milk condensing" in Switzerland, in Consular Report No. 27. I refer to these in order to save too much repetition of the same facts in the present report, though some repetition will be necessary for convenience.

The information contained in the tabular statements, I may premise, are believed to be very authentic and trustworthy, as they are compiled for me by some of the best cattle-growers in the country.

As remarked in a previous report, Switzerland has been famous for the productions of its dairies for centuries. At the international cattle show in Paris, in 1878, every Swiss cow exhibited bore away a prize. The result of exhibiting Swiss cows has been almost as favorable at other fairs in Europe, and especially at the great cattle show of Hamburg, recently closed. The Brown Schwytzer race of cows has, within a few years, or rather since Switzerland has commenced exhibiting at international shows at all, borne away premiums from Holland, England, Denmark, and other famous cattle-producing countries.

These Brown Schwytzers are not a new race of cattle, suddenly discovered to be of great value for the dairy. On the contrary they were known for their good qualities long ago, and the breed has, in certain districts, been kept pure for several centuries. The Brown Schwytzer is a native of Switzerland, and has its name from the canton of Schwytz, where the race has been bred longest, and where the purest blood is found to day.

The leading characteristics of this cow are—

(1) Its good milking qualities.
(2) Its perfectly mild disposition.
(3) Its adaptability to most climates and localities.
(4) Its great beauty of form and color.

THE BROWN SCHWYTZERS AS MILKERS.

A good Brown Schwytzer will average, for three hundred and sixty-five days in the year, not less than 10 quarts of milk daily, and that on grass and hay alone. This is not the exceptional rate, resulting from special care and special feeding, but the good average of thousands of these cows, taken from whole herds. I shall avoid entirely here any reference to special cases of extraordinary milk production, as being useless and misleading. I take it that what our farmers wish is facts as to what an *average* good Swiss cow will produce, not for a few months only, but for every day in the year.

Fortunately, there are some reliable records to be had, showing just about what this average production is. I quote, first, from my report on "Swiss dairy thrift," some statements based on recorded experience of the "Anglo-Swiss Condensed Milk Company" at Cham. Perhaps no more reliable statistics as to milk production exist in the world than the books of this company. It is, in short, the largest milk-condensing company known.

It uses the milk of not less than from five to six thousand cows at the principal factory in Switzerland, and of as many more at the company's condensing establishments in England.

The company's director, Mr. George H. Page (an American), feeds (as private property) the very finest herd of the Brown Schwytzer cows I have found in the country. Mr. Page keeps his herd of thirty cows in a large rectangular house, with brick walls and tile roof. The very broad ceiling is unsupported except by outer walls. It is very high, and the whole immense room where the herd stands is plastered throughout, and furnished with every modern improvement as to mangers, floors, ventilation, &c. This fine herd ranges in age from three to five years, few being over three years, and the cows average in weight 1,400 English pounds. One of them, a four-year-old (an exception of course), weighs 1,810 English pounds. The cows of this herd are, perhaps, in all respects above the average of Schwytzer, as they were mostly choice selections, and paid for accordingly, at prices reaching in single cases $200 to $240.

Mr. Page feeds only grass and hay, summer and winter, and that is worth bearing in mind. His cows are taken out to exercise daily, but never graze. Twenty-six of these three-year-old heifers produced in April, May, and June (after first calf) 28,076 liters of milk, or 12 quarts per cow daily; a large average when it is remembered that it includes almost every cow in the herd, and that none were at the best milking age. Mr. Page counts on these twenty-six cows averaging 15 liters daily, this coming year 1883. Three of the two-and-three-fourths year old heifers gave at highest points 19½ quarts daily, and averaged 10 quarts the year through. Three others, after second calf, gave 24 quarts daily for three months, and maintained a high average throughout the year. It will be most interesting to see the coming year's record of these Swiss cows stabled and fed on common-sense principles. The reports of the milk and butter of the many thousands of cows contributing to the condensing factory of Cham are most interesting.

In the year 1881 the condensers used the milk of between 5,000 and 6,000 grass and hay fed cows. They were milked about nine months, and produced on an average 5,315 pounds of milk per cow; that is, 19.7 pounds or 9.8 quarts of milk per cow daily, for the milking season.

In England, last year, 5,000 to 6,000 of the famous Shorthorn cows furnished to the English branch of the establishment an average of 4,668 pounds milk per cow for the milking year, showing a difference in favor of the Swiss cows of 647 pounds of milk per year.

The English farmers add oil cake, roots, and other artificial food to the hay of the cows, but they do not stall them so warmly in winter. In general, the milk supply is better in Switzerland in winter than it is in England. According to the report of the Department of Agriculture of the United States in 1875, the highest average of milk received at the best dairies of the State of New York reached 4,008 pounds for a high-fed cow in the year, a difference in favor of Swiss cows, without extra food, of 1,307 pounds per year. The average of fat contained in the milk of these thousands of Swiss cows is 3.3 per cent., though single cows show 4 to 4½ per cent. fat, or oil, in the milk.

The terms "fat" and "butter" are used synonymously, for while there is more butter than fat or oil contained in the milk, the butter cannot be taken away wholly, hence the amount obtained about equals the fat. It is found that something less than 31 pounds of milk is required to produce 1 pound of butter. At this rate, the Swiss hay-fed cows furnishing milk to the Cham Condensing Company could produce, on an average, say 175 pounds of butter to the cow for the season; an average that would bear most favorable comparison with the average butter of 6,000 high-fed cows of the State of New York.

At the celebrated monastery of Einsiedeln, in Canton Schwytz, a careful record is also kept of the product of the cows.

One hundred and twelve head of cattle are kept at the monastery. Of these, fifty-seven are Brown Schwytzer cows. They receive no feed except grass and hay, the year through. The average of milk is 10 liters per cow, the whole year through. The highest quantity reached is 20 liters daily, given by some twenty cows of the fifty-seven, in the months of May, June, and July.

The cows calve mostly in autumn and spring. The latter season is preferred. At present, July 6, more than half the cows are herded on the Upper Alps. They were taken up in May and will come down in September. The milk, while up there, will average much less, but it will be excessively rich, owing to the sweetness of the short and scarce Alpine grass. Only the lighter cows are sent up on the Alpine slopes. Their milk, while there, will be made into butter and cheese in the little stone huts of the herdsmen, or "Senns," and these will be brought down in the autumn, when there will be a village festival in their honor. The cloister keeps five hands only for the one hundred and twelve head of cattle. These do all the feeding, grass-cutting, milking, &c. The wages paid them are very low; in summer 6 francs a week only, and board. Board is as follows:

Breakfast: Coffee, milk, and bread. (No butter.)
Dinner: Soup, wine, meat, vegetables, and bread. (No meat Fridays and fast days.)
Supper: Soup, potatoes, and bread. Potatoes changed for meat, half the evenings.

They work from 4.30 in the morning till 7 in the evening. One man can milk twelve cows in one and a half hours. In winter one man is expected to attend to fifteen cows.

Good cows of Einsiedeln sell readily at from $100 to $125. Even $150 to $200 is not so rare a price. These are not fancy prices. They are given because the cows warrant the investment. Good young Schwytzer bulls at Einsiedeln are worth about $150. One of the cloister bulls, three years old, which took second premium at Lucerne cattle fair, is valued at $200. He was worth $250 at two years old. At three to four years old bulls are sold to the butcher. Most of the Einsiedeln calves are raised. The poorer ones are sold at two weeks old to the butchers, and bring about $6. Only one opinion prevails at Einsiedeln as to feed for milch cows. Quantity of milk may be, and is, increased by artificial feed, but the quality they claim, as do most dairymen in the country, is reduced.

Farmer L——, in the neighborhood of Einsiedeln, gave me the record of his herd of some twenty-five cows. He has been keeping milch cows on this farm for fifty years. The average of result was not materially different from the average of other small and select herds. His cows give 10 liters of milk each daily, year in, year out. He has what is a great exception, well-ventilated cow-stalls. He gives the usual allowance of hay, viz, 30 pounds daily to the cow, and a spoonful of salt every other day. He also adds bran and shorts to grass—a rare exception. All his milk goes to neighboring factories, and is paid for at the stalls when milked at 4 cents a quart. His fine herd average about 1,300 to 1,400 pounds in weight. They are never out of the stall, not even to water. It seemed an unusual occasion for them when he had them all led out into the yard for my inspection.

At or near to Thalweil, I secured the statistics of a dairy using the milk of seventy-five cows. These seventy-five cows furnished 700 quarts daily, or about 10 quarts each, year in, year out, not counting the milk retained at home for the use of the families owning the cows. In July, 850 quarts daily are sent to the dairy. The milk is sold at 16 centimes, or 3.2 cents, the liter at this place, when not made into cheese.

The Cham Condensing Company pay the farmers 13½ centimes, or 2.6 cents, per quart or liter of 2 pounds.

A fair average for Schwytzer cows in Canton Zurich would be about 10 quarts daily for three hundred and sixty-five days in the year. Of course this average differs in the different districts of the country, and especially in the mountainous cantons, where the product is less, though the quality is considerably richer, owing to the sweeter grass. So much for the Brown Schwytzer as a milker.

CHARACTERISTICS OF BROWN SCHWYTZERS.

In appearance, the Brown Schwytzer is not really brown at all, but mouse-colored, and the nearer she is to the mouse color the more likely is the stock to be pure. She is round and plump in form, with very straight back; has sleek hair, large, mild, black eyes, smooth, white horns, tipped one-third their length with black. Ears large and lined with an abundance of white or cream-colored hair. The neck is rather short and powerful; breast deep and broad; the head is finely shaped; nose black with white ring about it; tongue also very black and rough. The udder is large, well shaped, and quite white, milk veins very prominent. Owing to her general plumpness of figure, she looks some smaller than she really is, as she is in fact a large cow. Her ordinary weight will average 1,300 to 1,400 Swiss pounds, and often more. Altogether, she is as handsome a cow as exists anywhere in Europe. The accompanying cuts and photographs give a fair representation of her form and appearance.

Ordinarily, though there are single exceptions, the Swiss cows are fed only grass and hay, summer and winter, and this, in the valleys at least, is always carried to them in the stalls. The Swiss cattle stalls are usually low stone houses, with little or no ventilation, and are almost dark. They are kept very clean, however, and the cattle are cared for almost as well as Americans care for fine horses, many being even curried and cleaned daily. Every pound of manure is saved in a reservoir and put into the meadows in liquid form.

FEEDING AND CARING FOR BROWN SCHWYTZERS.

By extreme care of meadows in the way of manuring, draining, watering, and preventing stock trampling them, large and excellent grass crops are secured; and, aided by a moist and temperate climate, three grass harvests are obtained yearly. In Canton Zurich grass land is valued at $300 per acre, and good Schwytzer cows at from $125 to $150 apiece; and yet, by their unusual care of both meadows and cattle, Swiss farmers earn from 8 to 10 per cent. on the investment, and sell milk at cheaper rates than are demanded anywhere in the United States. Naturally, the query is repeated, What profits might Western American farmers make on milch cows, with land at $50 an acre and cows at $40 apiece, were the same care taken of cows and meadows in America as is taken in Switzerland?

Only two items in the list are against us, viz, dearer labor and "scrub" races of cows.

The former is outbalanced by the dearer land in Switzerland, and as to the "scrub" cows, it is our own fault if we continue milking them. They cost as much to feed and to breed and to milk as good cows, and the profit on them is not nearly as much.

BROWN SCHWYTZERS IN THE UNITED STATES.

It is worthy of remark here that certain Americans in the Eastern and New England States have been trying these "Schwytzer" cows on Yankee soil for the last ten years, and, as I am informed, with the most satisfactory results. Otherwise, some of these same breeders would not have been in Switzerland in this year 1883 adding to their stock of Brown Schwytzers.

There is at Worcester, Mass., I think, a society called the "Brown Swiss Breeder's Association," and a "record" or "herd-book" of the Swiss cows bred and owned by them has been published. As this society is increasing its herd of Schwytzers, it would seem conclusive proof that this race of cattle takes well to the climate and the soil of the United States.

The first Swiss cattle breeder and dealer to send Schwytzers to the United States was Landammann Bürgi, of Arth, Canton Schwytz. He is still in the business, and breeders and importers of cattle cannot do better than to correspond with him directly. Mr. John Bruppacher, of Rüschlikon, Canton Zurich, is also engaged in delivering Swiss cattle to foreign countries. Still another dealer and breeder is Mr. Berg, at Schwytz, who owns a fine herd on the Frohn Alp, by Lake Lucerne; also Mr. Giger, of Ragatz, who breeds and sells cattle.

THE BROWN SCHWYTZERS IN EUROPEAN COUNTRIES.

Within a few years the sale of the Brown Schwytzer cow to other countries has been on the rapid increase, and prices have gone up from 50 to 60 francs on a cow in a single year. The principal countries importing these cows have been Italy, Germany, and Russia.

Small numbers have been taken to England, America, and Spain. With the exception of Spain, I have heard only satisfactory reports as to the results of these importations, even where climates and soils differ so widely.

MARKET VALUE OF BROWN SCHWYTZERS.

A year ago I reported to the Department that Brown Schwytzers were being exported quite largely to Italy, Germany, and elsewhere, and that the prices for the same were rapidly rising.

Within a few days, by attending cattle markets at Ragatz, Sargans, and points in Appenzell, I have collected material as to prices obtained at absolute sales, and I find the average market value constantly rising, though checked at present, of course, by approaching winter and rainy days at the market towns. The prices demanded varied immensely, regular dealers demanding 20 per cent. more than did the farmers for the similar stock.

In the neighborhood of Ragatz, Vason, Mayenfeld, and down towards Canton Zurich, prices for Brown Schwitzer cattle average about as follows:

	Francs.	
Yearling steers	300 to	600
Two-year-old steers	500	700
Yearling heifers	200	300
Cows with calf	500	900
Young cows	500	800
Old cows	300	400
Yearling bulls	700	800

One and a half year old bulls, 900 to 1,200.

Good six months old calves, about 200 francs.

At a Sargans market this month I found prices considerably lower than those quoted above; they vary in fact in the different valleys materially, and at different seasons of the year.

I purchased for Americans, last August, in Canton Zurich, a number of fine four and five year old cows, at 650 to 800 francs each, and for a year and a half old bull, 1,000 francs was paid.

They were all select cattle.

HOW TO EXPORT SWISS CATTLE.

The freight from Zurich to Antwerp per car load is about 300 francs.

The freight on cattle per "White Cross line" from Antwerp to New York, or to Boston, is as follows:

	Per head.
For grown cattle	£8
For yearlings	7
For calves	6

The foregoing includes water and feed on shipboard. The men accompanying the stock have free passage. If no men accompany the stock the ship company provides hands for the purpose, and an extra charge of 4 shillings per head is made.

In short, the cost of transporting full-grown cattle from Zurich to New York may be reckoned at very nearly $50 per head, and for yearlings, $40.

S. H. M. BYERS,
Consul.

UNITED STATES CONSULATE,
Zurich, October 23, 1883.

SWISS CATTLE AND DAIRY PRODUCTS.

REPORT BY CONSUL BEAUCHAMP, OF ST. GALLE.

GOVERNMENTAL ASSISTANCE TO SWISS CATTLE-BREEDERS.

Switzerland claims for herself one of the first positions among the European states with regard to her cattle, milk, and the products thereof. The principal breeds are widely known in Europe and their origin dates with the beginning of Swiss history. As breeders they are much sought after. When a farmer or cattle-raiser in Germany, Italy, or France wishes to improve his breed he generally makes a selection from a Swiss herd, for experience has long since been made that Swiss cattle, reared and grazed on Alpine grass, with plenty of fresh running water and pure air, are the healthiest and hardiest known to the herd-book.

The Swiss breeder pays great attention to "pure bloods," and is very careful that no "cross" occurs, which accounts for so many "pure-bloods" one sees in the Swiss herd-book. As a rule only the finest formed and best marked animals are kept for breeding purposes, and the result is that the quality of Swiss cattle is yearly improving. To encourage farmers and breeders in this respect the various cantonal and district governments in Switzerland offer premiums in stipulated sums to be awarded at the county and district fairs, which are held in the spring and fall of each year. This system of governmental recognition and assistance is a great stimulant to breeders of pure bloods, and beyond cavil a proved success. In the award of premiums the greatest care is taken by the judges in considering all points, and the least defect as to color, form, size, &c., often proves disastrous to the exhibitor, and the consequence is that the farmers and breeders are always on the *qui vive* that their pure-bloods reproduce themselves in their offspring. I am informed by reliable cattlemen that this governmental assistance has had a marked effect in the cattle improvement of Switzerland, and that it is confidently expected that within the next half century the Swiss breeds would not only be a pure line of blooded stock, rich in the product of milk and the products thereof, but excellent in meat, and a perfect show animal, beautiful in form and color. About three years ago the federal authorities ordered experts to make an examination into all pedigreed cattle in Switzerland, giving names, ages, degrees, &c.; which was done, and the report condensed into a herd-book, where all the pedigrees of pure-blooded cattle in this country may be found.

Switzerland contains but two distinct original breeds, as follows: (1) The Spotted or Fleckvieh race; (2) the Brown Schwytzer or Braunvie race. There are, however, several offshoots from the two principal breeds, which will be considered further on in this report.

THE SPOTTED BREED.

The Swiss Spotted breed belong to the heaviest of the European races. In evidence of this fact a case is cited where a Simmenthal cow of this breed, which was premiumed at a cattle show held at Lucerne in 1881, weighed 1,134 kilograms.

Out of other cattle premiumed at the same fair the following measurements, showing proportions, &c., are given in centimeters (1 inch = 2.5400 centimeters), to give some idea of the size of these animals:

Description.	Height, top of withers.	Circumference behind shoulders.	Length from horns to root of tail.
Bulls (average of 28 head)	137	202	208
Cows (average of 27 head)	140	205	213
Heifers (average of 21 head)	135	196	205

The "Freiburg" cattle represent the heaviest and coarsest animal of this breed; is usually white, with large black spots; big boned; rather heavy head; long body; large loose barrel, and traditionally known as a sort of gluttonous, fat-making machine, more particularly suitable to produce gross meat for the markets at great expenditure for artificial food.

The above measurements represent the Simmenthaler Spotted cattle. They are a trifle smaller than the Freiburg cattle and are better formed, with deep shoulders, powerful forearm; long, straight back; long from shoulder-blade to hip-bone, long from point of hip to root of tail; wide, square buttock, with round, close barrel; they are usually of white color, with pale red or yellowish spots; white face; nose milk color, with wide, open nostrils. They are highly recommended as milkers.

The size of these animals varies very much with physical features, the fertility of the country, and the more or less advanced state of its agriculture. In the high Alp districts, where the farms are small and the food poor in quality and not very plenty in quantity, the cows are smaller and do not sell for more than $50 or $60, while in the richer grass-land districts, where the artificial manuring is largely resorted to, the cattle are worth much more, and bring from $80 to $125, and sometimes more. Their weight is from 1,500 to 2,500 pounds, and some have been known to reach 3,000 pounds, live weight. Their fattening capacity are said to be very great, but they require good food, careful attention in their handling, and perfect cleanliness about their stalls. The Simmenthalers, or, as they are somtimes called, "piebalds," are considered the best milkers among the Spotted cattle. The better class cows are reckoned and averaged on reliable experiments to give from 11½ to 13½ quarts per day, counting three hundred milk days in the year, and the second class from 9 to 11 quarts. At this rate the better class cows would produce on an average 12 quarts per day, or 3,600 quarts in the year, which, at 3 cents per quart (a low average), would make the milk-yield of one cow reach the sum of $108 per annum.

These cows are of a kind and gentle disposition, and it is claimed they can do a large amount of work without lessening either the quantity or quality of the milk.

I am informed that while the larger and middle sized Brown Schwytzers are perfectly healthy and feed well when grazed on the open mountains, yet they do not fatten readily; but when brought down in the lower districts or valleys and grazed and stabled, they not only fatten much faster, but take on more flesh than the animal bred in the low lands. In consequence of this fact the German breeders prefer for fattening purposes the Swiss cattle bred in the middle mountain regions. When these cattle arrive at maturity and are butchered in their own homes they seldom weigh over 1,000 pounds gross, but when taken down into the lower valleys, or over into Bavaria or Baden or Nassau, they can be made to weigh 1,600 pounds gross at the age of three years.

OFFSHOOTS OF THE SPOTTED BREED.

From the original Spotted breed there are several offshoots; among them are—

(*a*) The Berneroberlander breed, which is a shorter and lower built animal than those before mentioned. It has powerful shoulders, rather narrow buttocks, and is well adapted for grazing the high mountain sides.

(*b*) The Jurrischer, or half-piebalds cattle of the Jura, with less form and size, but very hardy, and easily satisfied with the hard, dry food of the Alps.

(*c*) The Ormonds, Illiez, and Lötschen breeds, whose homes are in the high mountain dales of the cantons of Freiburg, Vaud, and Valais, and only weigh from 400 to 700 pounds.

The Swiss breeders hope in the near future to entirely wipe out these inferior offshoots of the principal Spotted breed under the governmental system of assisting in the improvement of agriculture.

THE BROWN SCHWYTZER BREED.

The Brown Schwytzer is considered the dairy breed par excellence of Switzerland.

When pure they are more or less light or dark brown, with muzzle quite black, and ringed with cream color; horns white, with black tips, and medium size; and a very distinguishing light-gray streak running from the horns down the back to the root of the tail. They are somewhat smaller than the Spotted breed, but are of beautiful formand compactly built, as the following measurement will show:

Measure in centimeters.

	Height.	Length.	Girth.
Bull (average of 11 head)	130	192	196
Cow (average of 11 head)	132	195	201
Heifer (average of 11 head)	126	182	195

In judging this breed the color plays a far more important part than in the Spotted breed. The color most desired is the very dark brown, which indicates the purer blood.

The hide, hair, and bones are much finer, and the milk organs much better developed, than in the Spotted breed. The flesh is also of a much finer fiber, and, consequently, sweeter and tenderer, than the larger breed.

It is claimed that the Brown Schwytzer not only gives more milk, but that it is richer than that of any other European breed of cattle. They are estimated to produce from 1½ to 2 quarts more milk per day than the large Simmenthal cow. I have just returned from a visit to the stables of Mr. Kühn, of Degersheim, the largest pure-blooded breeder of the Brown Schwytzer in Switzerland, and he tells me that his herd of forty cows average from 17 to 20 quarts of milk per day. Of course this is an exceptional case, but it demonstrates fully what this breed is capable of under good treatment.

The original home of the large Brown Schwytzer was in the cantons of St. Gall, Schwytz, Zurich, Glarus, Lucerne, Unterwalden, Graubünden (lower part), and Appenzell, but they are now largely distributed all over Switzerland, and in portions of Germany, Italy, and France. Many of the best young cows of this breed are bought up by Italian farmers and drovers, through their agents in this country. They pay from 400 to 800 francs per head, and for extra fine ones as high as 1,200 francs is often paid at the central cattle markets at Chur and Schwytz.

MISCELLANEOUS SWISS BREEDS.

In addition to the large Brown Schwytzer every valley and neighborhood in East Switzerland has its own small cross-breed, generally from the Brown Schwytzer.

The Toggenburg breed is distinguished by its dark-brown color, long slim neck, shapely head, round, close barrel, and outstretched form, and is reputed to give very rich milk.

The Appenzell and Einseidelens have short thick necks, black heads, rather short bodies, and are of coarser fibered flesh.

The high Alps of East Switzerland, like the Berneroberland, have a very small breed, which in some parts of the United States would be considered of the "scrubbiest" order. They have short stubby legs, small round barrels, thick coarse hair, and easily stand the cold bleak winds and deep snows of the high Alps. They climb like goats, and "grub" for subsistence on the mountain sides and peaks where the heavier cattle could not go. These ugly little animals are also reckoned as crosses to the Brown Schwytzer, but some writers place their origin as distinct and anterior to all other breeds in Switzerland. They are known as the Bündner, Léviner, and Hérens breed. They give very rich milk and weigh from 400 to 500 pounds.

There has of late years been introduced in the Engadine Mountains a new and still smaller breed to take the place of goats; their weight is from 250 to 300 pounds.

CANTONAL PRIZE SHOWS.

The custom of all cantonal governments is to offer yearly and half-yearly premiums for the improvement of the cattle breed of this country, and I only desire now to speak with special reference to my own consular district.

The canton of St. Galle makes a yearly appropriation of 20,000 francs for the purpose of awarding premiums to the breeders of pure-blooded cattle. The sum is classified as follows:

	Francs.
Bulls	14,000
Milch cows	5,000
Miscellaneous (handling cattle)	1,000
	20,000

As a rule, the *large* Brown Schwytzer carries off the prize. The Toggenberg breed, however, is a good show-animal, and it often becomes a victorious competitor. The canton is divided into ten show-districts. The judges take into consideration and decide on the following points:

SCALE OF POINTS FOR BULLS.

	Points.*
1. Head, fine and tapering	
2. Forehead, broad	
3. Cheek, small	
4. Muzzle, fine black, and ringed by light-gray color	
5. Nostrils, wide, high, and open	
6. Horns, smooth, clean, and not too thick, with tapering black tips.	
7. Ears, light-gray, rather large and thick, with orange-color within	
8. Eyes, clear, full, and lively	
9. Throat, clean, neck powerful but not too heavy	
10. Chest, broad and deep	
11. Barrel, hooped, broad and deep, but little space between last rib and hip	
12. Back, straight from withers to top of hip, thence straight to setting of tail.	
13. Tail, hanging down to hocks	
14. Hide, mellow and movable, but not too loose	
15. Hide, covered with fine, soft, dark-brown hair	
16. Fore-legs, short and straight, powerful fore-arms.	
17. Hind-legs, short, straight, and not to cross in walking	

---

* The consul failed to supply the points in detail.

	Points.
18. Hind-quarters, from hock to the point of rump, long and well-filled	
19. Hoofs, hard, black, and not too small	
20. Growth, general appearance, and condition	
Perfection	100

SCALE OF POINTS FOR COWS.

Same as bulls, except—

2. Fore-head, narrow, with rather long face	
6. Horns, small, turned-up, with tapering black tips	
9. Eyes, full and placid	
10. Neck, straight, fine, and placed lightly on shoulders	
16. Fore-arm, swelling and full above knee	
21. Udder, large in form and standing well out behind, but full in line with belly	
22. Teats, large and squarely placed, behind wide apart	
23. Milk-veins, very prominent	
24. Hide, deep yellow-orange color	
Perfection	114

In the heifers the scale of points are the same as cows, and they are considered perfect at 111 points before they have dropped a calf.

The greatest importance is attached by the judges to the beautiful form and purity of blood in bulls for breeding purposes, and as most of the peasants and small farmers are unable to keep one of the pure-bloods on account of the dearness of the animal, one is generally owned and kept at the cost of the various districts or townships; and by this means the cows belonging to the peasants and small farmers are served, and the pure-bloods are continually on the increase. Cattle shows or fairs are considered as a sort of public holiday by the peasants, and they are attended in large numbers. The exhibition is sometimes free and sometimes not. The premiumed animals are usually decorated with wreaths and garlands, and receive the dye or stamp of the fair by having the same burned into the horn. I have seen prized cattle with their horns almost branded full from the impressions made by the different society brands.

Brown Schwytzer bulls generally serve cows at the age of sixteen to eighteen months, but some of the best breeders and cattlemen say this is too early, and that they should not be allowed to serve before two years old, as they are then fully developed and give more strength and better constitutions to their offspring.

OLD AND NEW SYSTEMS OF STABLING CATTLE.

The old Swiss system of feeding and caring for cattle is fast giving way to new developments which are being made in the improvement of the various breeds, and experience is teaching the people that it is as necessary to the good health of cattle and other animals that they have plenty of light, air, and commodious quarters as it is to human beings; and the consequence is that whenever a new stable is built or an old one is remodeled, great care is taken that the stalls shall be so constructed as to give the animals more room, better ventilation, good light, and opportunity for cleanliness. During my visit to many dairy farms and peasant stables in quest of information for this report, I have been absolutely astounded to see the sort of places cattle are kept in in some parts of the canton of St. Galle. I visited one stable where fifteen cows were kept. The stable proper was about 25 feet long by 15 feet wide, and not to exceed 6 feet high in ceiling; there was no window in the wall, except a hole, low down to the floor, about 16 inches in diameter, by which the stalls were emptied of the manure. The stench was simply unbearable, and yet I was told that this was the "old way" of stabling cattle in Switzerland, and it was thought by many that the cows produced more milk than if they had more air and room. The cows stood eight on each side, with scarcely room enough for the peasant to push himself through behind the cows to clean the stable, and so close together that it seemed impossible for them to lie down, certainly not with comfort. Advanced dairymen and experienced breeders take the common sense view that, while heat greatly assists in the milk secretion, yet impure heat and air cause disease in cattle, and consequently cause the milk to sour and taint more easily.

HANDLING AND CARE OF CATTLE IN THE ST. GALLE DISTRICT.

In the cantons of St. Galle, Appenzell, Graubünden, &c, the cattle are handled through the year as follows:

Caring through the winter.—Through the winter, from the middle of November until the end of March or April, the cattle are continually kept in the stables, and are fed almost entirely on dry hay, which has been made on the meadows which lie in the valleys, and which are mown two, three, and four times a year, owing to the quality of the soil and the manner of manuring. These meadows are drained by open ditches when necessary, and are well manured twice a year, and sometimes three times a year, with stable and artificial dungs. The cattle are fed three times a day. Milch cows are sometimes fed a small portion of corn-meal or turnips in addition to the hay. They are watered twice a day by being led out in the open air to a running stream, or to the tank of an artesian well. The young cattle do not receive much fat food, and are often fed the whole winter through on the wild grass* of the high Alps, which, however, is said to contain highly strengthening qualities, consisting of large quantities of very nutritious and aromatic herbs, said also to be very good for milch cows.

The conditions under which agriculture is followed here are so peculiar that it would be hard to compare Switzerland with either England or America.

The higher the altitude the more herbs and the more the grass is filled with spices; in fact, one might say the middle and higher alpine pastures of my consular district consist almost entirely of herbs, as they are situated from 1,700 to 3,000 feet above the level of the sea. Only in the lowlands and valleys are the cultivated grasses grown, and even about the towns and villages in this part of Switzerland the grasses are about 25 per cent. herbs, and in conseqence of which the hay will always bring one-fourth more in the markets than if grown in the lowlands.

---

* This grass grows on the highest (vegetation altitude) Alps, and is very difficult to cut and take care of. The mode of harvesting is as follows: In the haying season the peasants go up on the mountains, and begin mowing on the almost precipitous mountain side with sickles or short scythes. The peasants, before beginning their day's work, however, make themselves fast by means of ropes tied about their bodies, and securely fastened to a stake driven in the ground or tied to the rocks. When the hay is cut and ready for transport, a long rope is made fast on the mown ground and continued down the side of the mountain until the valley is reached. The peasants tie large bundles of hay together, and placing them on their backs and shoulders begin their dangerous descent by taking hold of the rope with one hand and using it as a sort of banister or "hold-back" until the perilous journey is at an end. It often happens that the rope breaks or gives way under the pressure of several peasants at a time, and the result is breakage of limb or loss of life.

To continue with the stable treatment, it is correct to state that the cattle are thoroughly curried and rubbed once and often twice a day, the trouble and time being fully repaid by the loosening of the hide on the calves and those intended for fattening, as they grow much faster and accumulate flesh more readily. In well-kept stables great care is taken that the stalls are kept dry and clean, the custom being to rebed the cows each day, with an armful of either fresh straw or hay litter, which also adds largely to the stable-dung supply. The stables are usually cleaned twice a day. The manure is either packed up in small ricks some distance from the barn or shoveled into sinks, made especially for the purpose, just outside the stalls, and is either put through a distilled course or doctored with water into a liquid state and drawn off through pipes, or dipped with a long-handled bucket into a very long tank on wheels (somewhat resembling a street-sprinkler) and driven to the fields with either cows or oxen and thoroughly distributed over the ground, the cost and labor of which is more than doubly repaid by the soil producing two or three times the quantity, and a much better quality, of hay than the ordinary dry-manuring or old turf-sod.

CATTLE GRAZING ON THE ALPS.

On the low Alps.—With the spring begins different treatment; the cows and fine breeding animals generally receive half dry and half green food. As soon as the grass has grown a little, may be in April or at the beginning of May, cattle are grazed on the lower meadows, usually tethered or herded by old men, small boys, or girls. This grazing period only lasts ten days or a fortnight, as the grass must not receive too great a check, as the result would be a small hay crop on which the herd must depend for its winter food. From this low meadow grass a move is made on to the first mountain step, which is called the "Maisäss," or May seats. Sometimes we have the "Aprilsäss," but not often.

On the high Alps.—The "Maisäss" runs from the middle or end of May until the middle or latter part of June, when another move takes place, as it will not do to imperil the hay crop which is also expected from these lands. By the end of June the cattle are up to the high Alps, "Hochalpe," where they remain until October.

In this part of Switzerland the Alps consist of three stations or table-lands, the highest of which can only be grazed about three weeks in the middle of summer. At this station open sheds are sometimes put up to protect the cattle from sudden snow-storms or cold rains, which often occur. On the second station a more substantial structure is built and is not only used as stables but as a milk and dairy station. The alp is usually owned by a *commune*, and young cattle and milch cows are taken on pasturage at so much for the season (about $6 or $7), in which case the cows or heifers are sent directly to the "Hochalpe" in May or June, where they remain until the end of October, when the grass begins to get short and the weather cold, and they are brought directly to the valleys.

It has been thought proper to minutely describe this system of grazing in order to explain the large flow and the excellent quality of milk obtained in the Alps. The results are, cows fed on dry hay in winter, calves timed to come, if possible, in February or March; green feed in early spring starts the milk secretion; later on, when the good effects of this are on the wane, the milk production gets a fresh stimulus from the nutritious grasses on the "Maisäss." Further on there is another change to the fine short grass and aromatic herbs of the "Hochalpe," where the milk is richest in flavor and contains the most milk-sugar. Its delightful sweetness and flavor is unattainable by any other feeding in the world, and this is imparted to the butter and cheese, which, when well made, are in the highest state of perfection.

It should be understood, however, that high alpine grazing is not generally followed by the larger farmers or dairymen where several cows are kept, for in such cases the herd is stabled and grazed in the valleys in the neighborhood of the towns and villages where the milk is sold.

The high Alps are grazed by herds of young cattle and cows owned by the peasants, which are picked up by ones and twos all over the neighborhood of the alp. The herd, when made up to the number which the alp is by law registered to graze for the season, is driven up to the "Alphütte," "Sennhütte," or chalét, where the cows are milked and given a little salt and bran boiled in whey with a little hay, after which they are allowed to rest a few hours in the stables. They are then taken out to the pastures, where they remain until the evening, when they are driven to the "hütte" to be milked and sent out again directly afterwards. On very hot days they are kept in the stables during the hottest part of the day, also in cold rainy weather they are stabled, especially if there is no woods on the alp.

DAIRYING ON THE HIGH ALPS.

The "Sennhütte" is usually intended for summer occupancy. It is a long low and rudely constructed shed, mainly built out of roughly hewn pine logs with one end mortised into the rocks of the mountain side, and the others laid across each other, and fastened together with long beech-wood nails. The solid roof covering consists of heavy beams of 1½ feet in diameter, with boards 1 inch thick, 12 inches wide, and about 3 feet long laid on top. These are fastened down by having several long poles stretched across them and weighted down with a lot of heavy stones weighing from 50 to 100 pounds to keep the roof from being blown off. The site selected for the stables must have near it plenty of fresh running water, necessary for the cattle and important in the care of the milk and butter. At one of these stations on the high Alps the milk and butter retain the sweetness for weeks without the least taint. The "Sennhütte" is residence, cow-shed, milk-house, and butter and cheese manufactory all together. The milk-house, butter and cheese department is generally in one room. The cow-sheds, where the milking is done, adjoins and is connected by a door with the milk, butter, and cheese room, and the room occupied by the tenders of the herd. The services of two people are generally required to attend to the dairy properly, and are usually a man and woman; they are called the "senn" and "sennerin." The cows are milked twice a day, and the product of each milking is weighed and placed to the credit of the owner of the cow separately, and at the end of the season a balance-sheet is made out showing exactly what has been the product of the cow during her stay at the "hütte." Alpiculture in Switzerland is of very old standing. It is said that some alps have declined within the last half century 50 per cent. Some have increased slightly of late years on account of cantonal and central government premiums being offered for the improvement of alpiculture.

PURITY OF ST. GALLE MILK.

The milk product of my consular district is important. Much of it is consumed, both in its natural state and its various forms of manufacture; but Swiss statistics are so very meager that it is difficult to arrive at any approximate amount of either the product or consumption. As a rule farmers and dairymen prefer to sell the milk in its natural state on the grounds; it seems to them that there is more money in it than by converting it into cheese and butter. The custom, therefore, is for those in the neighborhood of towns and cities to deliver the milk directly to the consumer at so much per quart, say 3½ cents.

Chemical analysis of milk at St. Galle.

[From the cantonal chemical laboratory.]

	Per cent.
Dry substance	12.5
Fat	3.4
Caseine and albumen	4.0
Milk-sugar	4.35
Milk-salt	.75

The local laws protect the purity of the milk, and a dairyman or milkman detected in falsifying milk or selling skim-milk for unskimmed-milk is liable to both fine and imprisonment.

MILK-CURE ESTABLISHMENTS.

There is a dairy in the suburbs of St. Galle where the cows are fed on nothing but dry food the year round. The milk is recommended for infants and aged people, is delivered by the dairyman from wagons at 7 cents per quart, and is claimed to be of considerable sanitary importance. There are also several "molkenkuranstalen"—milk-cure-establishments—in the neighborhood of St. Galle, which have existed for many years, and where people are treated for various diseases entirely with milk.

EXPORTS OF SWISS CONDENSED MILK.

From the most reliable source I can find, it appears the amount of condensed milk exported from Switzerland during the last eight years was as follows:

	Kilograms.
1875	4,261,750
1876	5,610,100
1877	5,499,100
1878	6,419,700
1879	7,813,800
1880	9,229,300
1881	11,591,400
1882	11,621,500

CONDENSED-MILK MANUFACTURE IN SWITZERLAND

There are three milk-condensing factories within my consular district, one at Gossau, one at Romanshorn, and one at Utweil.

Each of these factories condense milk according to its own method, but none of them use sugar. The condensing apparatus used is similar to that used by condensing factories in the United States. The milk is condensed down to one-third of its original volume.

The greatest possible care is taken to use none but good, clear, pure milk, produced from healthy cows if possible, pastured on high or undulating well-drained ground, with plenty of clear, sweet, running water, and every quart of milk is tested before it is put into the boiler.

These factories rent the milk products of a certain number of cows the year through, and require the milk to be delivered at the factory twice a day, where it is paid for by weight at from 2½ to 3 cents a quart, the highest price being paid in the winter season.

The most scrupulous cleanliness is observed in every detail. In the first place the peasant, in milking his cow, is requested to take particular pains in having the cow's udder and teats clean, and to see that no filth drops into the milk, and the milking utensils are perfectly cleansed after each milking.

When the milk is brought to the factory it is strained through a double hair-sieve from the scales into a large tin or zinc tank, from whence every detail of manipulation is guarded by cleanliness; for it is an established fact that not only the cows should be fed on good, sound, healthy food, with kind, gentle treatment, but that unless the building is well ventilated, plenty of pure running water, and an entire absence of all taints and ferments, the process of condensing milk which will keep will prove a sure failure.

The Swiss Milk Company of Gossau has the reputation of being one of the best (without sugar) condensing factories in Europe, as their milk has been tested in hospitals, in armies on the march, on the sea for weeks at a time, and in the hot climes of India, and has proved itself in every instance perfectly condensed, pure milk. The milk is packed and sold in pint and quart bottles, with the American patent wire corkings. Zinc and tin cans, holding from 3 to 15 gallons, are also being used now; the advantage, it is claimed, is in the saving of the cost of bottle, the cost of packing, and weight.

The following analysis of the pure milk was made by Dr. Hehner, of London:

	Per cent.
Fat	8.35
Milk-sugar	11.46
Albumen	12.85
Ash salts	1.82

This milk is sold by wholesale at 2 francs per quart, and is considered the beginning of a most formidable rival to the famous Angelo Swiss Condensing Milk Company at Cham, where sugar is largely used and which increases the cost and makes the milk no better.

This Gossau company has only been established a little over one year, and the shares are at a premium of 20 to 30 per cent., which goes to show that there must be fair returns for the money invested in it.

CONDENSED-MILK FACTORIES IN THE UNITED STATES.

The condensed milk is so easily portable, the natural facilities are so great, the necessity in the near future for an outlet to our dairy products so important, that it seems to me the country *par excellence* for the manufacture of condensed milk should be the United States. Everything is in our favor—country, location, climate, natural facilities, cheap grass, cheap cows, inventive genius, native application, and all the qualifications necessary to a formidable competitor. If our factories will make as good condensed unsweetened milk as is made in Switzerland it is almost absolutely certain that we can supply Great Britain, her colonies, and the South American States with this, for the future, important staple.

BUTTER-MAKING IN SWITZERLAND.

The Brown Schwytzer cow is peculiarly adapted to butter-making, because of the cream-globules being unusually large in the milk, which rise more easily to the surface, and the cream is churned more easily and quicker into butter.

It is known that the fatty substance—butter—is not in solution in the milk, but exists in the tiny drops, or globules. One pound of milk containing 40 per cent. of butter should hold about 40,000,000 globules. Every one knows that when milk is left to stand for a length of time the cream rises to the surface and is easily separated, leaving the "skim-milk" beneath. The largest of these little globules is estimated (in cream) to weigh about .00000004 milligrams. These globules of fat being lighter than milk, naturally seek the position which their special gravity entitles. The larger globules rise the quickest and first, the medium ones next, and so on. The average gravity of milk is about 1.030. The difference between this and .985 brings the cream to the surface under a slow process; the very small globules never come to the surface. In different breeds of cattle, with different kinds of food and treatment, the quantity and size of the globules vary very much. In visiting the Centrifugal Butter Factory at Wyl, in my consular district, I saw milk being tested in a glass tube about 15 inches long and 4 inches in diameter; after twenty-four hours' standing the cream appeared to have risen perfectly, leaving a clear and blue line of "skim-milk," but on an examination of the "skim-milk" there were found globules still in it, of the size upwards of $\frac{1}{2000}$ of an inch in diameter, showing a wonderful richness of the milk of the Brown Schwytzer cow.

As a rule, the Swiss dairymen hold to the old system of setting milk shallow as the best and quickest mode of getting the cream. The vessel generally used is made of wood, and is from 16 to 20 inches in circumference at the top and 8 to 10 inches at the bottom, with sloping sides.

Some advanced dairymen, however, disagree with this, especially as regards wood, and are using the ordinary American milk-pan, claiming that they can be kept cleaner and are not so easily impregnated with taints, &c.

The milk under ordinary circumstances stands from twenty-four to forty-eight hours, when it is "skimmed" and turned into the churn. Sometimes the Holstein barrel is used, and sometimes the old upright piston churn with perforated holes at the end of the piston; but the churn generally used throughout the country is the revolving barrel, with stationary dashers on the inside, very wide or large circumference, and revolves on its axis like a grindstone.

The churn is filled about half full of cream, at a temperature, more frequently guessed at than tested, of near 56° to 58° F., and churned at from 30 to 40 revolutions per minute, according to the season. The butter comes in twenty or thirty minutes. The churner should be careful to listen to the slightest alteration in the sound, and when detected, the churning should at once cease, and if, upon examination, small particles of butter, no larger than a pin's head, are found, the churning is properly finished. The buttermilk should be drawn off through a hair sieve. After the buttermilk has been drawn off the particles caught in the sieve should be emptied back and the churn filled about half full of pure water, when after a few revolutions of the churn the water and buttermilk should again be drawn off, and this process continued three or four times until the water comes out of the churn as clear as when it was put in. This process of washing and cleansing not only takes out the buttermilk entirely, but consolidates the butter, so that very little working is necessary to make it pack properly.

The butter is made up into small rolls of one pound and one-half pound each, and is sold to dealers at from 30 to 35 cents per pound, and to the consumer at about 45 cents per pound.

Most of the Swiss butter is made from sweet cream, and salt is never mixed with it unless specially so ordered.

SWISS IMPORTS AND EXPORTS OF BUTTER.

The following table will give an idea of the approximate amount of butter (including other fats) imported into and exported from Switzerland during the five years of 1878 to 1882, inclusive:

Years.	Imports.	Exports.
	Kilograms.	*Kilograms.*
1878	5,311.700	445,700
1879	5,821,700	441,700
1880	5,052,600	586,100
1881	5,180,290	836,400
1882	4,223,200	672,000

The Swiss butter when properly made is of a deep yellow color, fine nutty flavor, and delicate sweet taste. The home demand is about equal to the supply, and if any difference, hardly sufficient.

CENTRIFUGAL BUTTER-MAKING IN SWITZERLAND.

The new system of making butter by means of centrifugal force is being introduced at Wyl, in my consular district. The discovery is German, and was first introduced at the International Dairy Show at Hamburg, in 1877.

The complete separation of the cream from the milk as taken fresh from the cows occupies about 35 minutes. The Centrifugal Butter Company of Wyl claim that they can not only make better and cleaner butter by centrifugal force, but that they can make 15 per cent. more butter from the same amount of milk than the old mode of setting the milk and churning in the usual way. This butter is sold in the market at St. Gall, and gives general satisfaction.

CHEESE-MAKING IN SWITZERLAND.

Cheese-making in Switzerland is a very old industry, but only during this century has it developed so as to take a position of importance in the world's markets. On the high mountains, during the summer seasons, considerable attention has been paid to the manufactory of cheese by the peasants for many years, but not until about 1830 were associations formed for this purpose. From that period, then, one might say, Switzerland dates as a cheese-making country.

The best-known kinds of cheese made in this country are as follows: Emmenthaler, Gruyère, Spalen, Saanen, Fromaggio della paglia (in the Valmagia Tessino), Urseren, Bellelay, Vacherin, Schabzieger, Battelmatt. The most important of these cheeses is considered the Emmenthaler, which is generally made of whole milk (Fettkäse), that is, milk which has not been skimmed. These are of the largest-sized cheese made in Switzerland, and weigh from 75 to 125 pounds; the diameter is from 3 to 4½ feet. In some of the very large factories cheese is made in the morning and in the evening from fresh milk. The usual custom, however, is to make but once a day, in the morning, and for this purpose the evening's milk which has been set is skimmed in the morning and poured into the large kettles. To this cream is sometimes added the fresh morning milk, and the whole heated up to about 107° to 112° F., during which time it is well stirred until no more flakes of cream can be seen on the surface. At the highest temperature the evening skim-milk should be added and the heating stopped at a temperature of 86° to 98°.

The rennet used is sometimes milk-vinegar, and sometimes pieces of calve's stomachs, steeped for twenty-four hours in whey, which is thoroughly mixed with the milk. In thirty-five or forty minutes the milk gets thick and is coagulated, when it is cut up into squares with a wooden knife, after which a shallow wooden bowl with a handle is used to break the curd evenly into pieces about the size of small apples. At this stage a curd-breaker is used to break the curd into small pieces about the size of peas, when the breaking is stopped and the curd allowed to settle for ten or fifteen minutes, after which a fire is again started under the kettles and the whole stirred until a temperature of about 140° is reached, when the kettle is taken from the fire and the stirring continued until the curd is ripe. The mode of testing differs among the cheese-makers. Some squeeze between their fingers and others bite the curd. Curd to be properly "ripened" should be stirred from an hour to an hour and a quarter, and a minute or two before the stirring ceases it should be stirred so rapidly that a sort of funnel to the bottom of the kettle is formed, which makes the curd settle more compactly and be more easily taken out with a cloth. The cake is formed by the curd being placed in a cloth, incased with a hoop the width it is desired that the cheese to have depth.

Sometimes regular cheese presses somewhat like the American press is used, and sometimes a weight or derrick press; about 17 or 18 pounds of pressure to 1 pound of cheese for twenty-four hours is employed, when the cheese is taken out and put in the cemented cellar to cure. During the process of curing the cheese is rubbed daily with salt for two or three weeks, when the cheese is taken from the cellar to the cheese room above ground, where the salt rubbing is resumed every other day for a few months, when the salting is less frequent. For large cheese often a year and sometimes a longer period is required before it is ripe or may be used. From 4½ to 5½ per cent. of salt is required.

Good Emmenthaler cheese, when ripe, should be a compact mass without cracks, but when tested on the inside should contain round small holes about the size of peas, which must contain a little liquid. These holes should be evenly distributed all through the cheese. The cheese ought to melt on the tongue without leaving any small crumbs and have an agreeable, sweet taste.

Magerkäse, or skim-milk cheese, is generally made in the winter when little milk is at disposal, and the process is similar to the Emmenthaler, except the milk is skimmed and more rapidly cooked without the butter substance, which makes it harder and tougher.

Gruyère cheese is also made very like the Emmenthaler except the rennet is added at a lower temperature, say 86° F.

Battelmatt cheese is made entirely for home consumption, as it will not bear transport. It is made from fresh milk directly coagulated with rennet and boiled for forty-five or fifty minutes, stirred for one-quarter of an hour and then hung up in a cloth for the whey to drip off, when it is put into wooden bowls and salted daily until consumed.

Vacherin cheese is a kind of cream cheese, and is only made in the winter, but as a smeary cheese is considerably used and is very palatable.

Saanen is a skim-milk cheese and is so hard that it is easily grated; it is used much in soups throughout Switzerland; it is made in cakes of 15 to 25 pounds.

Urseren cheese is made mostly in the canton Uri; the cakes weigh from 50 to 60 pounds. It is also made of skim-milk.

Schabzieger, or Krauter cheese.—This is a very important manufacture in this and the southern parts of Switzerland; the number of pounds made yearly is said to be several millions.

The process of making is as follows:

The milk is thoroughly skimmed after sitting as long as possible, when it is poured into a kettle and heated up to a boiling point, and about 20 per cent. of cold fresh buttermilk is added; after which the heating is continued, but not at such high pressure as before, and sour whey is added and the kettle is taken from the fire.

After it has coagulated, the curd is put in large, strong hemp sacks or boxes, the bottom of which is perforated with holes, and pressed with large stone weights or beam pressure.

The *zieger* then undergoes a kind of fermentation at about 62° F., which lasts a month and a half or two months. If the temperature is too high the *zieger* is apt to be readily decomposed, while if the temperature is too low it will get blue and tough. When the *zieger* has been put through a proper fermentation, it is put in a special mill and thoroughly ground, during which process 5 per cent. of salt and 2½ per cent. of dried *Meli-lotus cœrulea*, Lam., is added. This clover gives the cheese its bluish color and peculiar taste. The next process is to stamp the curd into small wooden forms, lined with cloth, which are about 5 or 6 inches high and 3 or 4 in diameter. The cheese "cures" for about one year, but is frequently used after being kept in cool, dry rooms for six months. The small forms are emptied by scraping with a knife. When the cheese is to be eaten it is first grated to a fine powder, and either used alone on bread or mixed with butter. Skim-milk cheese is sold in the markets here at 6 cents, and the cream cheese at about 20 cents per pound. Cheese factories are supplied with milk in a similar manner to the condensed-milk companies, and pay about the same prices. From good, rich milk 8 to 11 per cent. of cream cheese can be reckoned to the weight of the milk. The whey of milk is still boiled down into sugar in this part of Switzerland.

The whey is boiled until only a brown sirup remains in the kettle, which is poured in flat wooden dishes and left to stand for twenty-four hours, when it becomes like crystallized yellowish sand. This is washed in cold water and sold for medicinal purposes.

EXPORTS OF SWISS CHEESE.

The amount of cheese exported from Switzerland during the last ten years is estimated as follows:

	Kilograms.
1854	5,356,150
1860	7,339,450

	Kilograms.
1866	12,556,300
1872	19,271,600
1877	17,799,000
1878	19,579,900
1879	21,017,400
1880	21,718,900
1881	24,039,700
1882	26,025,700

To every condensed-milk factory, butter and cheese factory, should be attached or connected pig-sties, as the waste milk is large. This waste at some factories I have visited is sold at 1 centime per quart or liter.

PERCENTAGE OF CATTLE BREEDS IN SWITZERLAND.

The total number of cattle in Switzerland is reckoned at 1,100,000 head.

Out of this number three-fifths are said to be of the Spotted breed and two-fifths of the Brown. In my consular district the Brown Schwytzer stands at about 95 per cent. and the Spotted breed at about 5 per cent.

The total number of milch cows is estimated to be about 552,427 head.

If these cows averaged 10 quarts per day, the daily yield would be 5,524,270 quarts, or 1,657,281,000 quarts in the year, counting 300 milking days.

Mr. Charles Kuhn, of Degersheim, has had the kindness to furnish me with a copy of his dairy book for the last year, which gives a very good insight as to the mode of conducting dairies here, and is herewith inclosed, marked A.

SWISS CATTLE IN THE UNITED STATES.

From the general observations made during my residence in Switzerland, I am convinced that the Brown Schwytzer is a very desirable animal to import to the United States, and would do better with proper handling there than here.

In searching for information on this point I applied to Col. G. Bürgi, of Arth, in the canton of Schwytz, a very large pure-blooded breeder and exporter, and he informs me that the first shipment of the Brown Schwytzer breed to the United States was made in the month of September, 1869, from his stables. Quoting his words, he says:

> I sold to Mr. Henry M. Clark, of Belmont, Mass., 7 heifers and 1 bull, first quality. Soon after their arrival in the United States they were resold to Mr. D. G. Aldrich, of Worcester, Mass., and Mr. David Hall, of Providence, R. I. To judge from the result, it appears the herd fell into the right hands, for Mr. Aldrich must be a practical man in breeding blooded animals and believes in seeing that the line is kept pure. The very excellent quality of these animals, in milk, flesh, form, color, and working qualities, were so marked that they soon became known, and the result was that a number of intelligent farmers formed themselves into a society for importing and raising these pure-blooded animals, and a herd-book was begun. I am informed that from this 8 head imported in 1869 the number had increased in 1881 to 169 head. Without going further into details about this first shipment, what other remarks I may make on this subject are based on the reports of this society, as made public (Metcalf, publisher, Worcester, Mass.), referring to the Brown Schwytzer race. This very interesting publication contains the statutes of the society, gives the pedigree, name, and line of breed, and from whence originally imported, &c. I observe that the climate, grass, feeding, &c., in the United States agree with the imported animal amazingly, and that the change of soil and handling is entirely to their good;

that they are equally as healthy, give more milk, and become larger in stature than among their native mountains.

Milk trials of these animals have been made in the United States which for quantity has never been equaled in this country. A cow known as Genevena gave in seven successive days 196 quarts, weighing 415 pounds, or averaging 28 quarts daily.

Since the first shipment in 1869 the export of the Brown Schwytzer breed to the United States has been about as follows:

1882: 9 heifers (two years old) and 1 bull (two and one-half years old) shipped to Messrs. Scott & Harris, Massachusetts.

1883: 10 heifers, same firm.

1883, July 20: 5 heifers (two years old) and 1 bull (fifteen months) shipped to William Thoch, New York.

1883, August 5: 1 three-year-old cow, 10 heifers (one and one-half years old), and 1 bull (eight months old) shipped to Messrs. Rider & Eldrege, Middle Falls.

For importation the Americans prefer the young cattle that have been raised in the mountains, as they are hardier, stand the voyage better, and become acclimated sooner than the older animal.

In considering the results of the importation of Swiss cattle to the United States, the committee of the Boston Exposition in 1875 reported as follows:

"This herd of European cattle, with their offspring, is from the farm of Mr. D. G. Aldrich, and present an important exhibition of themselves; they surpass the Devon, Jersey or Guernsey for butter and milk product."

A sample of butter from these cows was furnished by Mrs. Aldrich and compared with that of the Guernsey cows by Professor Motley, and was pronounced in every respect equal to the Guernsey butter, and this is rated as the best butter in the world. At a butter show in the city of New York, Mrs. Aldrich competed with butter made from the Brown Schwytzer, and, although competing with the Jersey and Guernsey, received the prize. That the American handling, soil, and climate have a great and good effect on the Swiss cattle there can be no doubt, for the same committee says: "Bulls and heifers weigh at the age of two years from 1,000 to 1,400 pounds."

Mr. Eldrege, the gentleman who received the last shipment from Switzerland, wrote to Colonel Burgi as follows: "As you know, it is another new breed in America, and it is pronounced by all who have seen any of them *the best* for meat, milk, and butter of any other known breed, and there is a large and growing demand for them."

The best route of shipment is via Antwerp. The freight from this locality via Antwerp over the sea, with good pressed hay and meal, with attention, is: Heifers, from 200 to 250 francs; cows, 350 to 400 francs. The purchase of heifers (or bulls) a year and a half old is recommended, as they are not only cheaper to send, but stand the voyage much better.

EMORY P. BEAUCHAMP,
Consul.

UNITED STATES CONSULATE,
St. Galle, October 20, 1885.

---

*A milk-book of Charles Kuhn, Degorsheim, from July, 1882, to June, 1883.**

[Explanations: M., morning; E., evening; ½ liter = 1 pint; 1 liter = 1 quart.

Name of the cow.	July 15.		July 30.		Aug. 15.		Aug. 30.		Sept. 15.		Sept. 30.		Oct. 15.		Oct. 30.	
	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.
Brüne	9	9	9	9	8	8	7	7	4	3	4	2	....	....	....	....
Bethli	11	10	12	12	10	10	9	10	8	7	8	6	5	5	....	....
Daihsli	6	6	8	7	7	7	7	8	8	9	9	8	8	8	6	5
Wolfli	9	9	10	10	9	9	9	9	10	9	10	9	9	8	8	6
Porher	10	10	9	9	9	9	8	9	9	9	9	8	9	8	7	7
Hirschli	....	....	....	....	....	....	....	....	....	....	....	....	....	....	8	8
Bristhopf	....	....	....	....	....	....	....	....	....	....	....	....	14	13	10	10
Klupp	....	....	....	....	....	....	....	....	....	....	....	....	7	6	6	5

*The cows were tested on the 15th and the 30th of each month in *half liters.*

A milk-book of Charles Kuhn, Degorsheim, &c.—Continued.

[Explanations: M., morning; E., evening; ½ liter=1 pint; 1 liter=1 quart.]

Name of cow.	Nov. 15.		Nov. 30.		Dec. 15.		Dec. 30.		Jan. 15.		Jan. 30.		Feb. 15.		Feb. 30.	
	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.
Brüne	....	....	....	....	....	....	19	16	17	15	20	17	17	15	16	14
Bethli	....	....	....	....	....	....	20	17	16	14	19	16	16	14	16	14
Daihsli	6	5	6	5	6	5	6	5	6	4	6	4	6	4	6	5
Wolfli	7	6	7	6	8	7	8	7	8	6	7	6	7	5	7	6
Porher	7	6	7	6	7	6	7	5	6	4	7	5	5	3	4	2
Hirschli	8	7	9	8	8	7	8	7	10	9	9	7	9	7	8	7
Klötzli	....	....	....	....	....	....	....	....	....	....	....	....	9	8	9	8
Bristhopf	10	9	12	11	12	11	12	10	12	10	12	10	12	10	12	11
Klupp	6	5	6	6	6	5	6	5	6	4	6	4	5	3	6	4

Name of cow.	Mar. 15.		Mar. 30.		Apr. 15.		Apr. 30.		May 15.		May 30.		June 15.		June 30.	
	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.	M.	E.
Brüne	16	14	15	13	14	12	13	11	13	11	12	10	12	10	10	7
Bethli	15	13	15	13	15	13	15	13	14	12	15	13	14	12	12	18
Daihsli	6	4	6	4	7	6	6	4	6	4	6	4	6	4	5	8
Wolfli	7	6	7	6	8	6	7	6	7	5	8	6	7	5	6	6
Porher	....	....	....	....	....	....	....	....	....	....	17	15	16	14	16	14
Hirschli	8	6	8	6	8	6	7	6	7	5	6	4	4	2	3	4
Klötzli	9	8	8	7	9	8	8	6	9	7	9	7	8	6	9	4
Bristhopf	12	10	12	10	12	10	12	10	12	10	11	9	10	8	10	2
Klupp	4	3	5	4	4	3	4	2	4	2	5	3	4	2	4	3
Schimmel	15	13	15	13	15	13	14	12	14	12	14	12	14	12	12	10
Jungferli	....	....	....	....	....	....	....	....	....	....	....	....	9	8	10	8

Name of cow.	Number of trial days.	Total quantity of milk during trial days.	Average quantity of milk for each milking day during the year.	Total number of milking days during the year.	Daily average of each cow's milk during the year—365 days.	Total product of each cow's milk during the current year.
		Half liters.	*Liters.*	*Milk days.*	*Liters.*	*Liters.*
Brüne	19	454	11.647	290	9½	3,465
Bethli	20	489	12.425	305	10.4	3,805
Daihsli	24	284	5.917	365	5.9	2,160
Wolfli	24	353	7.354	365	7.3	2,684
Porher	19	315	8.3	290	6.6	2,407
Hirschli	17	232	6.82	257	6.8	1,753
Klötzli	10	159	7.95	150	8.0	1,192
Bristhopf	18	389	10.8	273	10.8	2,948
Klupp	18	163	4.528	273	4.5	1,236
Schimmel	8	210	13.125	120	13.1	1,575
Jungferli	2	35	8.75	30	8.7	262

CATTLE IN THE CONSULAR DISTRICT OF GENEVA.

REPORT BY CONSUL ADAMS.

I have collected the following information in reply to the cattle circular of July 18, and the memoranda added August 25.

Cattle census.—According to the Swiss cattle census taken in 1876, the number of cattle in this district was 193,404, distributed as follows:

Geneva	6,949
Tessin	44,188
Valais	65,024
Vaud	77,243

From 1866 to 1876 there was an increase for all Switzerland from a total of 998,291 head to 1,035,856 head, which is supposed to have been maintained at the same rate since, owing to the rise in values and encouragement given by the local governments.

Breeds.—The different breeds are so intermingled that it is impossible to give the percentage of each, or the percentage bred for the dairy and the butcher. Tessin alone has a distinct and uniform breed, known by its brown and even color.

MEAT-CATTLE IMPORTS.

In the four cantons named, constituting this district, cattle are only fattened for the butcher when they cease to serve for the dairy and reproduction. The supply being unequal to the consumption, there is no exportation save of choice individuals pure bred, but a large importation of cows and oxen from Baden and Austria and of beeves for the butcher from Italy. Nothing comes from the United States, whether cattle or products of the dairy.

American butter and cheese for Switzerland.—A suggestion made in one of my previous reports that American butter and cheese would find a ready sale here if put upon the market at certain prices was rather ridiculed by the Swiss press, but was certainly true, and perhaps is worth renewing, for Swiss butter is not of the best or the cheapest, and the cheese eaten by the people is bad.

American preserved meats.—Preserved American meats are already sold here in large quantities. Live cattle and fresh meat must wait for better communications with the seaboard. The tunneling of the Alps, and the new lines of through traffic north and south and east and west, are likely to make of Switzerland a great international entrepot and to change all the conditions of the market.

RESULTS OF BREEDING FROM IMPORTED CATTLE.

The cattle imported into Switzerland are never bred pure, and soon disappear as distinct breeds on crossing with the native breeds. These are of uncertain origin, and perhaps of high antiquity; at any rate must be treated as practically indigenous. No comparison can be made with their character and condition in their native countries, nor can one say what has been the effect on the breed by domestication here. Nor have I any information as to the extent and effect of their introduction into other countries. Whether they would produce in the United States offspring superior to the production here can only be known upon trial, but their superiority is so largely due to the excellence of the Swiss grasses that it may be doubted. The result suggested might very likely be realized in the later generations, after the breed had been thoroughly acclimated. It is certainly not worth while to import any of the small mountain breeds, such as are found around the Gothard, in the cantons of Tessin, the Grisons, the Valais, and Uri, as the very peculiar conditions of soil and climate under which they thrive at home could hardly be found east of the Rocky Mountains, if there, and they would not bear so long a journey well.

CHARACTERISTICS OF SWISS CATTLE.

The original of all the Swiss breeds is perhaps the race found in the primitive cantons. Two races are generally spoken of, the Spotted and the Brown, of even color, which again are subdivided into varieties according to origin, habitat, color, &c. I have added in a table all the details available of four breeds which have been selected as the fittest for domestication in the United States. It is to be said of them all that they have reached their excellence through the abundance and richness of the food-supply, and careful breeding and management, which have been carried to great perfection in the regions where they are found—the cantons of Bern, Zug, Lucerne, Schwytz, &c.

The foregoing information is drawn principally from a report made to me by Mr. R. Schatzmann, director of the Station Laitière Suisse, at Lausanne, the author of several publications and probably the most competent authority in my district on the subject. The annexed table is entirely filled up by Mr. Schatzmann.

LYELL T. ADAMS,
Consul.

UNITED STATES CONSULATE,
Geneva, November 21, 1884.

Statistics of Swiss cattle suitable for introduction into the United States.

Name of breed.	Annual average pounds of milk.	Milk to pounds of butter.	Milk to pounds of cheese.	Cantons where found.
	Pounds.	*Pounds.*	*Pounds.*	
Simmenthal	5,100	28 to 30	11 to 12	Argovie, Basle, Bern, Soleure, Zurich.
Freiburg	5,100	....	....	Freiburg, Vaud, Neufchatel.
Fratigen	5,840	....	....	Bern.
Schwytz	5,840	30 to 32	12 to 13	Primitive and Eastern Switzerland.

[Size in centimeters at maturity.]

Name of breed.	Cow.		Bull.		Ox.	
	Height.	Girth.	Height.	Girth.	Height.	Girth.
Simmenthal	160 to 162	210	160 to 165	240	180 to 190	250
Freiburg	160 to 162	210 to 216	160 to 165	240	180 to 190	260
Fratigen	140 to 150	205 to 210	165	202	170 to 180	230
Schwytz	136	200 to 210	130	200	140	230

Statistics of Swiss-cattle, &c.—Continued.

Name of breed.	Live weight.			Age at maturity.	Weight of meat at maturity in per cent. of living weight.
	Cow.	Bull.	Ox.		
	Pounds.	*Pounds.*	*Pounds.*	*Years.*	
Simmenthal	1,000 to 2,000	2,400 to 3,000	3,000 to 3,200	4	57 to 60
Freiburg	1,000 to 2,000	2,400 to 3,000	3,400 to 3,500	4	57 to 60
Fratigen	900 to 1,200	1,200 to 1,500	1,400 to 1,600	3½	57 to 60
Schwytz	800 to 1,500	1,000 to 1,500	1,200 to 1,600	3½	57 to 60

Name of breed.	Color.	Description.
Simmenthal	Red or tawny (fauve) White	Great height, strong workers, good milkers, easily fattened.
Freiburg	Black or white	
Fratigen	Tawny, white	Medium height, excellent milkers, easily fattened.
Schwytz	Brown, white and black	Same as preceding.

HOUSING, FEEDING, AND BREEDING IN THE GENEVA DISTRICT.

Methods of housing.—In the plains cattle are stabled the whole year. In the mountains they are pastured in summer; fed on hay and aftermath in winter.

Feeding.—Natural fodder (hay, aftermath, grass). In winter in plains artificial fodder is added, bran, flour, distillery-refuse, malt, &c.

Breeding.—Bulls are used from the age of one and a half years. Cows bear the first calf when two or three years old.

SOIL, SUBSTRATUM, AND GRASSES.

Soil.—Interminable variety. In Jura, calcareous. In the Alps, granitic. In plains, alluvial and diluvial; all varieties mingled.

Substratum.—Similar composition to preceding.

Cultivated grasses.—Natural grasses of very great variety in mountain pastures. In the plains cultivated grasses, timothy, clover, rye-grass, lucerne, esparcette, &c.

CATTLE IN MALTA.

No cattle are raised in Malta. The cattle that reach here for consumption are brought from Barbary, Tunis, and other neighboring countries. They are mainly classed as bullocks, are brought here alive, their fattening completed, and slaughtered as needed by consumers.

JOHN WORTHINGTON,
Consul.

UNITED STATES CONSULATE,
Malta, October 12, 1885.

ITALY.

CATTLE AND DAIRYING IN LOMBARDY.

REPORT BY CONSUL CRAIN, OF MILAN.

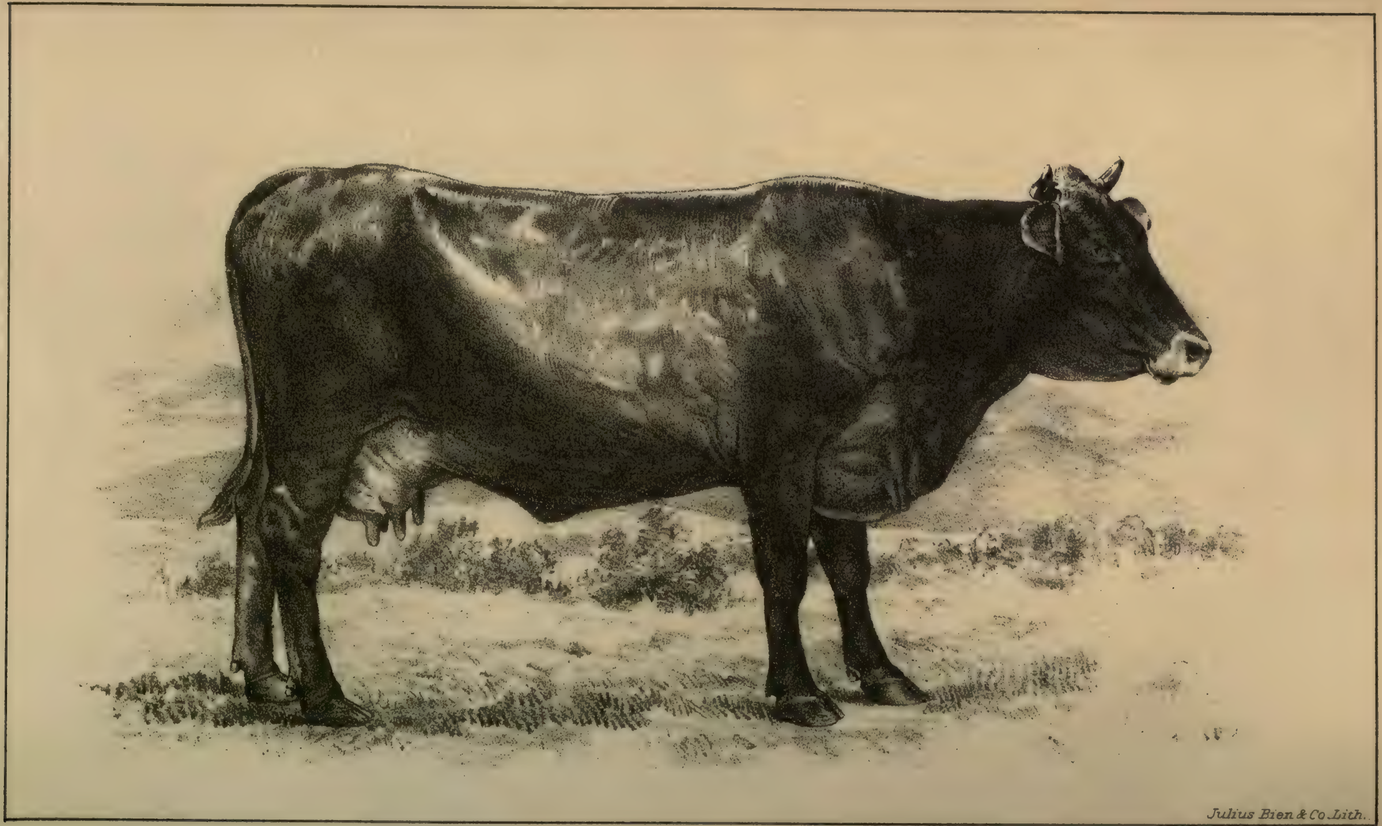
I have the honor to acknowledge the receipt of the circular of the Department dated July 18, 1883, which, however, did not reach this consulate until the 1st instant.

SWISS CATTLE IN LOMBARDY.

There exist in Lombardy only milch cows of Swiss breeds. They are yearly imported in large numbers from Switzerland, to supply the place of those which have become unprofitable for the dairy. In the irrigated districts grass is cut during eight months of the year, and on the winter meadows (*marcitorio*) during ten months. This fresh grass, supplemented with oil cake, meal, &c., is fed to the cattle, so as to produce the largest quantity of milk. Such a nourishment continued through so many months in stables, and in a mild climate, naturally soon exhausts the milking properties of cows, and necessitates the annual substitution of about 15 per cent. of the herd. The loss by this is more than met by the large product of milk, which averages yearly from 3,000 to 4,000 liters per head. Dairymen having 100 or more head ordinarily find it to their interest to send the calves, when a few days old, to the slaughter-house. This state of things having existed for a long time, it is evident that scarcely a trace remains of original Lombard breeds. The so-called Bergamasche and Brescian races are only a reproduction of Swiss stock.

The foregoing applies to the large stationary dairies of the Lombardian plain. In the irrigated district, bordering the river Po, there are large dairy herds, which are driven in summer to the rich pastures of the Alps, and which remain there until autumn, when they are taken back to the plain. There are also small dairymen in the mountains, who drive their cattle to the plain in winter. In these migrations are also included oxen, being raised for labor or beef; and the proprietors both of the plain and mountain districts supply themselves with dairy cows of Swiss breeds and oxen from the Tyrol. In the Alpine districts there are small races which take the name of the valleys in which they are raised, but they are a Swiss stock. Large breeds taken from the plain to high mountain districts, and there propagated, undergo in a few generations a decided change, from the effect of a different climate, soil, and diet. They become smaller, more hardy, and nimble of foot, and otherwise adapted to the requirements of their habitat. Lombard dairymen import their cows principally from the canton Schwytz, but some are brought from the cantons of Unterwalden, Zug, Appenzell, St. Gallen, and Glarus. They are preferred in the order named, and if breeds of these stocks are required they should be brought from those cantons.

The Tyrolese oxen above mentioned are first brought while young into the province of Brescia, and thence scattered over the plain under the name of Brescian oxen. They are short horned, of a grayish-white color, have the characteristics of the Podolico race. They are tall,



Julius Bien & Co. Lith.

COW OF CANTON SCHWYZ BREED.

EXHIBITED BY MESSRS. FOMENTI BROS. OF MILAN AT THE NATIONAL EXPOSITION HELD IN MILAN IN 1881.
AND FOR WHICH GOLD MEDAL WAS AWARDED.

heavy, white skinned, and easy to fatten. If breeders of this race are desired they should be obtained from Merano and Lana, in the Tyrol. Some oxen are brought from Emilia to the provinces of Cremona and Mantua, but those of the Tyrol are preferred.

Although there are no indigenous Lombard breeds, I would strongly recommend the breed of the canton Schwytz as well deserving the attention of American dairymen and stock-raisers, if the same has not already been tried in our country. Dairymen and stock experts here represent it as decidedly superior for the dairy to other Swiss breeds, and it is even claimed by many to be the best in Europe. The opinion of these persons should have some weight, when it is considered that the dairy industry is probably as strong in Lombardy as in any part of Europe, and that the butter and cheese product is so large that farmers find it to their interest to renovate their herds exclusively by importations from abroad. The magnitude of the industry may be better understood when I state that in the province of Milan, which contains 1,155 square miles, there are 132,928 cows, according to the last statistics. The butter known as Milan butter is largely exported and is highly prized in London, Paris, and other capitals. The several kinds of cheese known as Gorgonzola, Brintz, Gruyera, Formaggini, and Parmigiano are well-known in the great markets of the world.

The Schwytz cow is ordinarily of a dun color, weighs from 900 to 1,100 pounds, has short horns, which are black and white, and costs in the canton about $130. She is a hearty feeder, and, if well nourished, gives milk a longer term of years than any other cow known here. A peculiarity of the Schwytz is the long, light, coffee-colored hair growing from the interior of the ear, which is a conspicuous object in contrast with the dark coat of the head and neck.

Great attention has been given to the milking breeds of other countries by the Lombards, and their comparative merits are well understood; but at an important exposition of cattle held at Lodi in September last, the committee in charge of the subject unanimously recommended dairymen to replenish their stock from Switzerland, and the Schwytz breed received the first mention.

The form of the Schwytz does not present the smooth and delicate outline of the English breeds. It is thick and ox-like. I inclose a cut of one exhibited at the Milan National Exposition of 1881, and which secured the gold medal. The best route for the transportation of Schwytz breeders to the United States would be by the St. Gothard Railway to Genoa, and thence by steamer to New York. The railway expense is about $5 per head.

CATTLE BREEDS OF NORTHERN ITALY.

There are in other parts of Northern Italy types of cattle which are native or acclimated from time immemorial. Such is the breed of Piedmont, known as the Piedmontese or Carmagnolo race. This is a distinct type, tall of stature, short horned, grayish-red color, and with a conformation, especially the cranium, closely resembling the Garonne breed of France. It is essentially a stock for beef or farm work, and is fattened and largely exported to France, where, as beef, it is rated as inferior only to the beef of the best French stock. Cattle of this breed, or of subraces closely allied to it, are found in every part of Piedmont.

Emilia, in its northern part, about Piacenza, has a specific type of oxen called Bardigiana, red or mottled with white, and long-horned.

In the plain toward Parma is the race known as Reggiana or Parmense. This has been bred with much care, by selections from the best, and is considered excellent for mixed uses, *i. e.*, for labor, fattening, and milk. In form, fineness, stature, and weight these animals are regarded as the type of the large races bred on the central plains of Europe; but the uniformity of the red coat, without marks, and the thick, short-limbed body are considered proof of the acclimation of this breed in Emilia in remote ages. Zoologists assert that it is descended from the ancient *bue Italico.* South of the Taro, and extending beyond Bologna, are cattle known as the Pugliese breed.

PORTRAITS OF ITALIAN PRIZE CATTLE.

I inclose cuts of animals exhibited at the national exposition held at Milan in 1881, as follows:

Bull Jupiter, belonging to the agricultural committee of Savigliano, of Piedmontese breed.

Bull Pertinace, owned by Mr. Manara, of Asti, of Piedmont breed.

Bull Adams II, one and a half years old, of the Chianina (Tuscany) breed for work.*

Young bull Napoli, exhibited by the agricultural committee of Lendinara, and of Pugliese breed, for farm work.

Bull Ghinassi, three and one-half years old, Pugliese breed, for work oxen.

Bull Tigro, of Freiburg-Fruilana labor breed, two years and nine months old.

Bull Maestoso, of Mantua labor breed, exhibited by the Agricultural Society of Mantua, and awarded medal.

Cow Mantova, of the Freiburg (Swiss) breed, eleven years old, from the estate of S. Rossore, belonging to King Umberto.

Heifer Anversa, Holland breed, exhibited by the Agricultural School of Brescia, and awarded gold medal.

Fausta, five years old, Pugliese breed, exhibited by the Agricultural Society of Lendinara (Rovigo).

Cows Minerva and Cole, of Brittany breed, awarded silver medal.

DUNHAM J. CRAIN,
Consul.

UNITED STATES CONSULATE,
Milan, November 30, 1883.

BUFFALO CATTLE OF TERRA DI LAVORO.

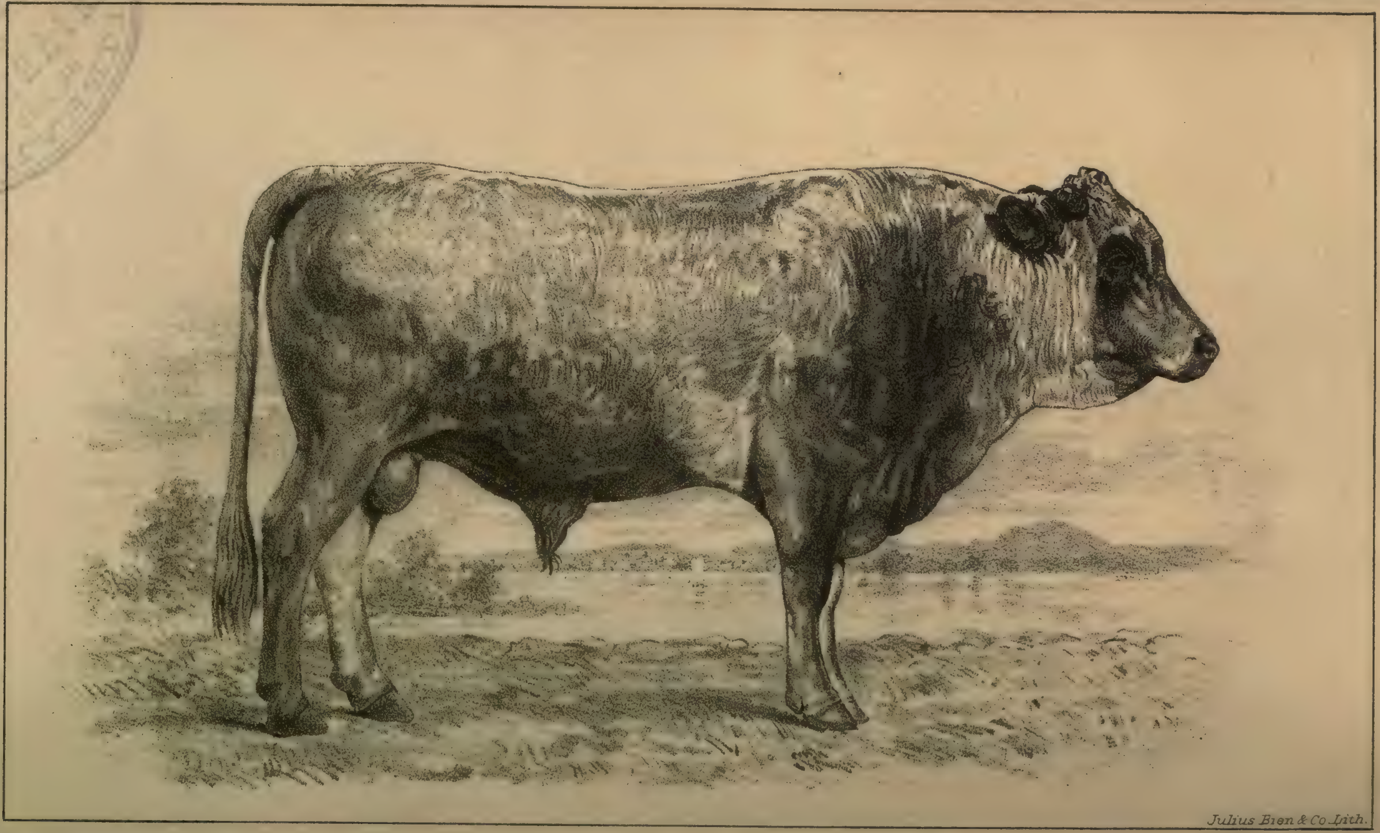
REPORT BY CONSUL HAUGHWOUT, OF NAPLES.

I have the honor to submit to the Department of State a report upon the breed of cattle within this jurisdiction, in compliance with the requests contained in the circular of the Department of State, dated July 18, 1883.

The area of country included within the limits of this consular jurisdiction furnishes a race of cattle peculiar in its characteristics. By far the largest and most important portion thereof is domiciled on the plains lying to the north and east of the province of Naples, the so-called "Terra di Lavoro," once called the "Campagna." This tract of land is a vast plain of trachytic tufa, overlying beds of clay deposits, which, in turn, rest upon a substratum of limestone. It is about 100 feet above the level of the sea, and enjoys the same degree of mildness of climate as the near province of Naples, that is to say, the mean temperature in

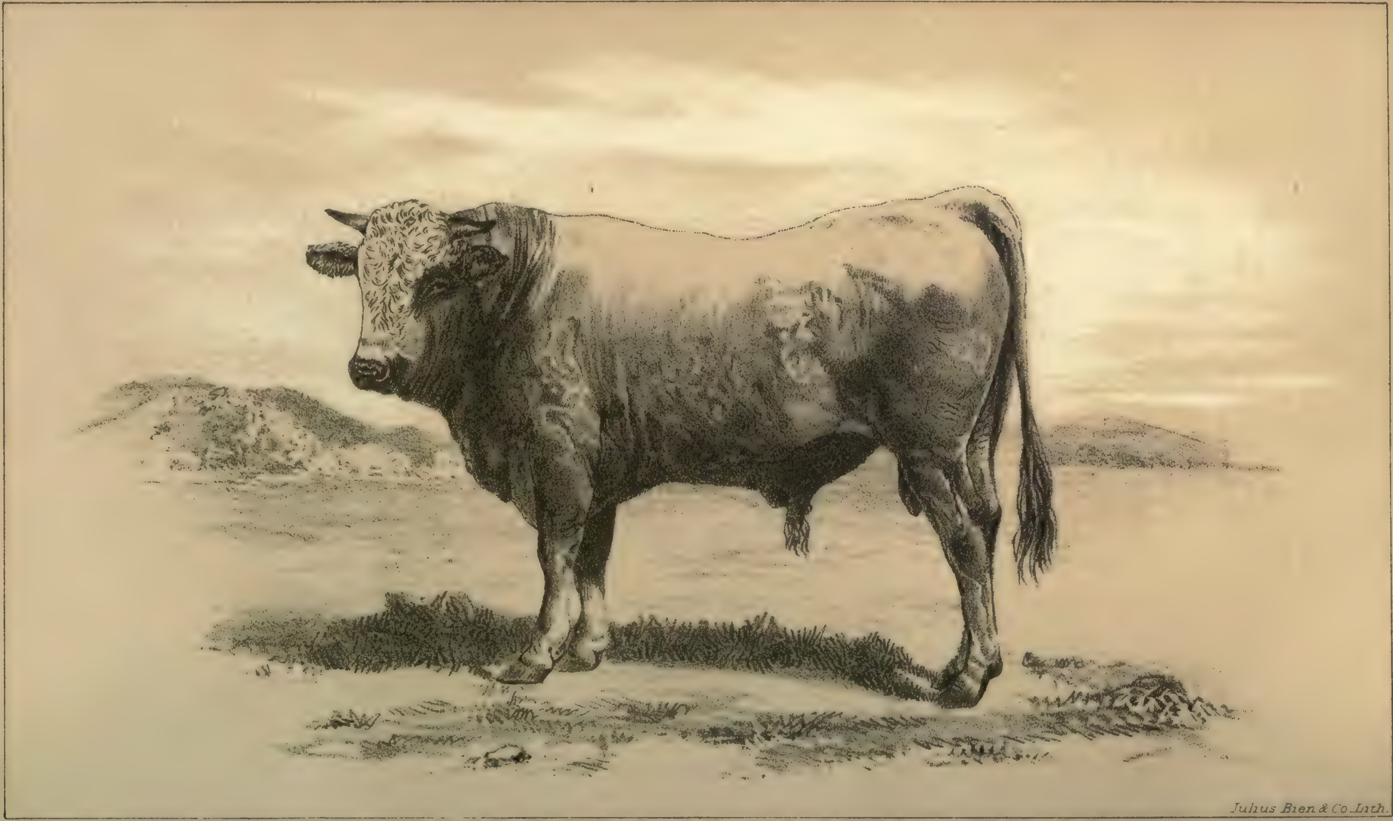
---

*Transferred to report by Consul Crosbey, of Florence, concerning this particular breed.



Julius Bien & Co. Lith.

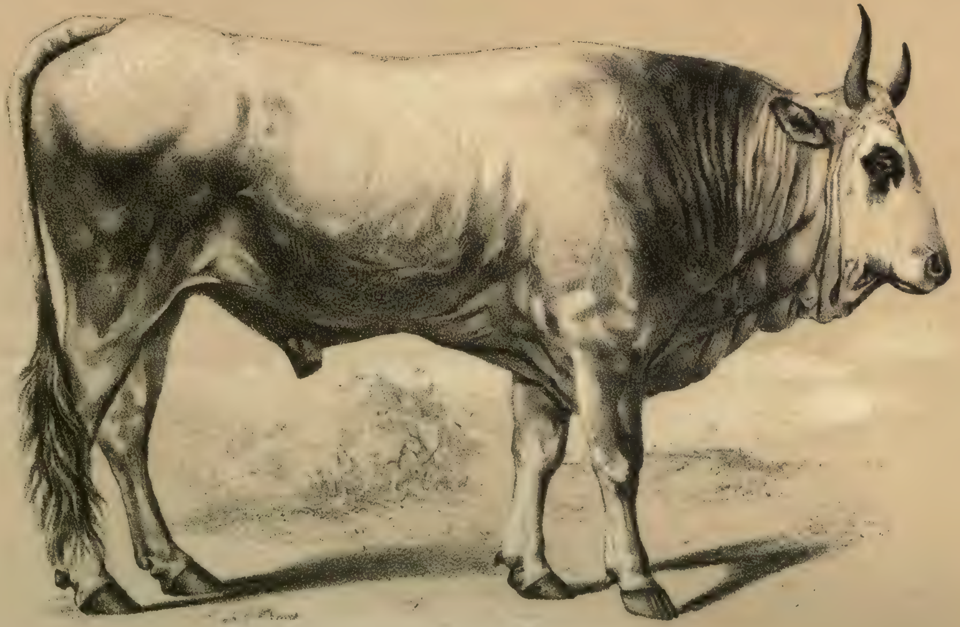
BULL "JUPITER"



Julius Bien & Co. Lith.

BULL "PERTINACE"

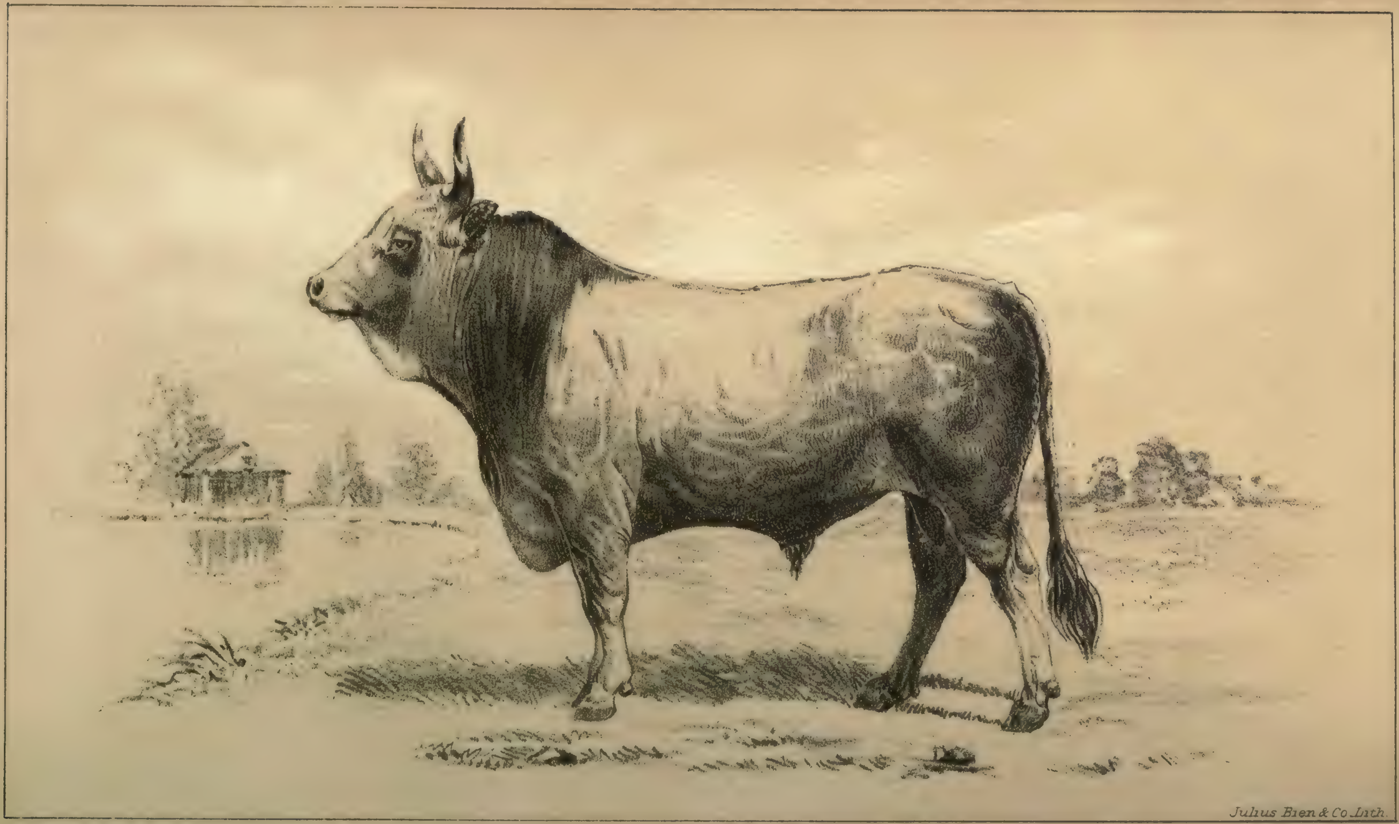
OWNED BY MR MANARA OF ASTI OF PIEDMONT BREED



Julius Bien & Co. Lith.

YOUNG BULL "NAPOLI".

EXHIBITED BY THE AGRICULTURAL COMMITTEE OF LENDINARA

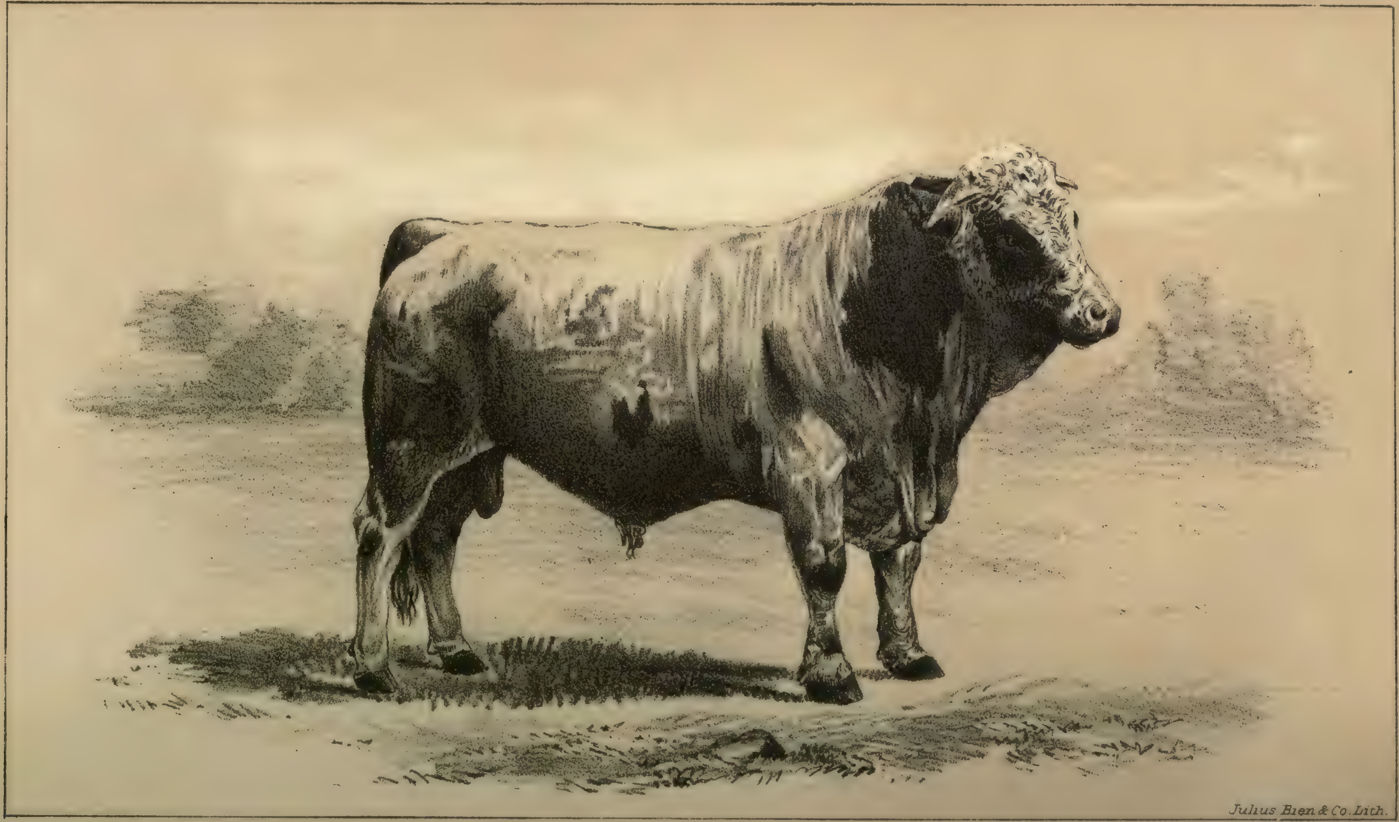


Julius Bien & Co. Lith.

BULL "GHINASSI"

3½ YEARS OLD, PUGLIESE BREED, FOR WORK OXEN

PLATE 146

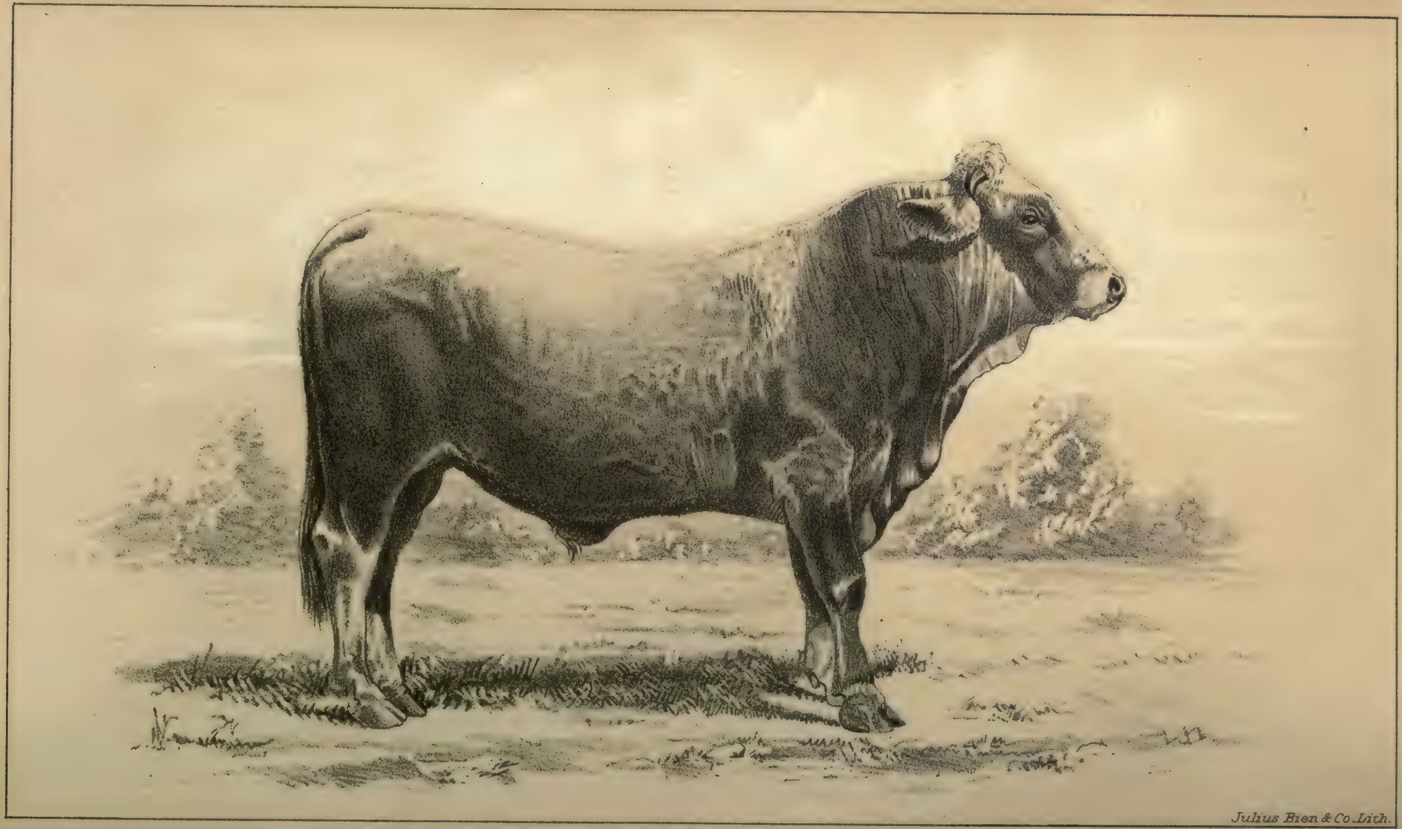


Julius Bien & Co. Lith.

BULL "TIGRO"

OF FRIBURG, FRIULANA LABOR BREED, 2 YEARS 9 MONTHS

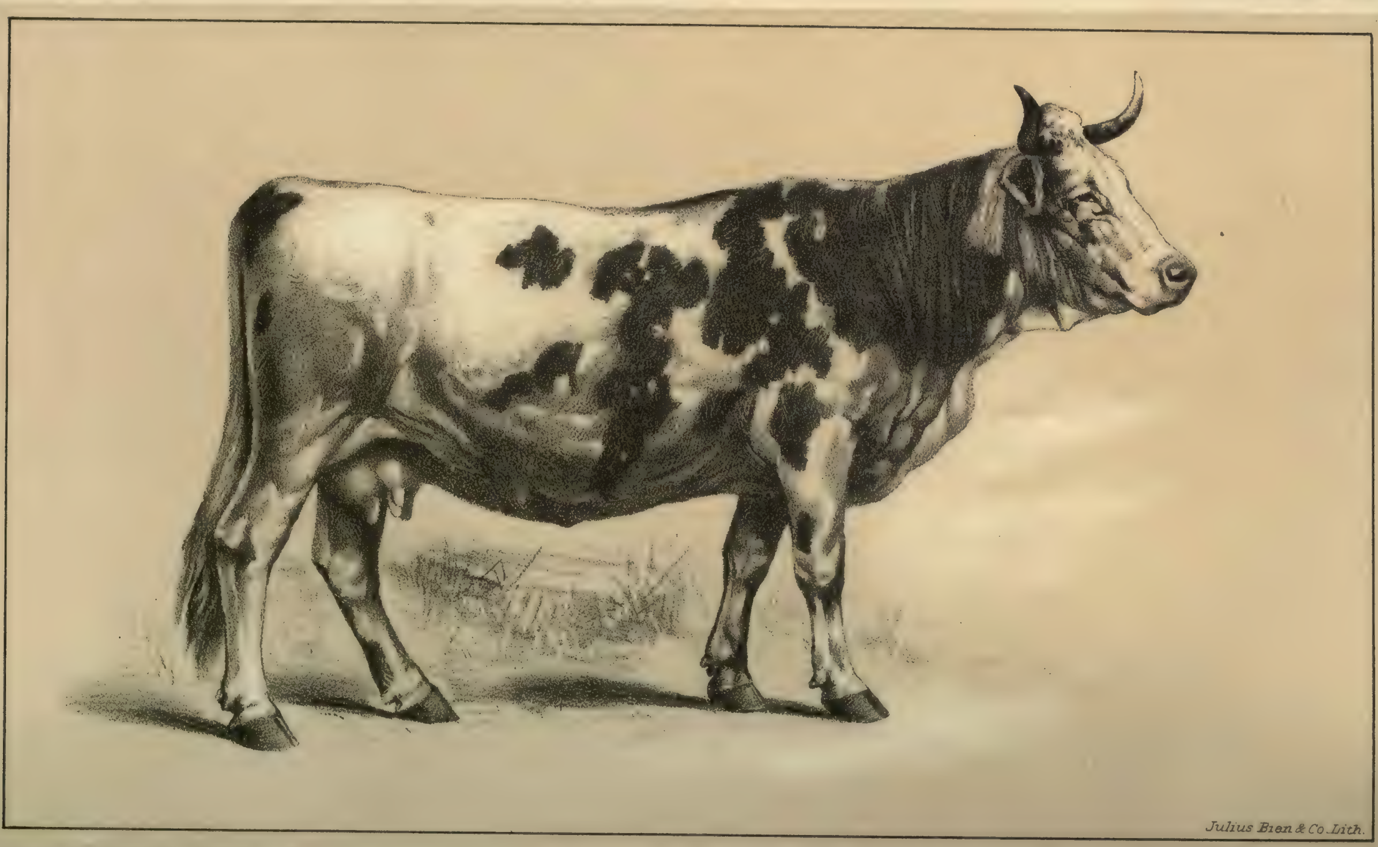
PLATE 147



Julius Bien & Co. Lith.

BULL "MAESTOSO"

OF MANTUA LABOR BREED, EXHIBITED BY THE AGRICULTURAL SOCIETY

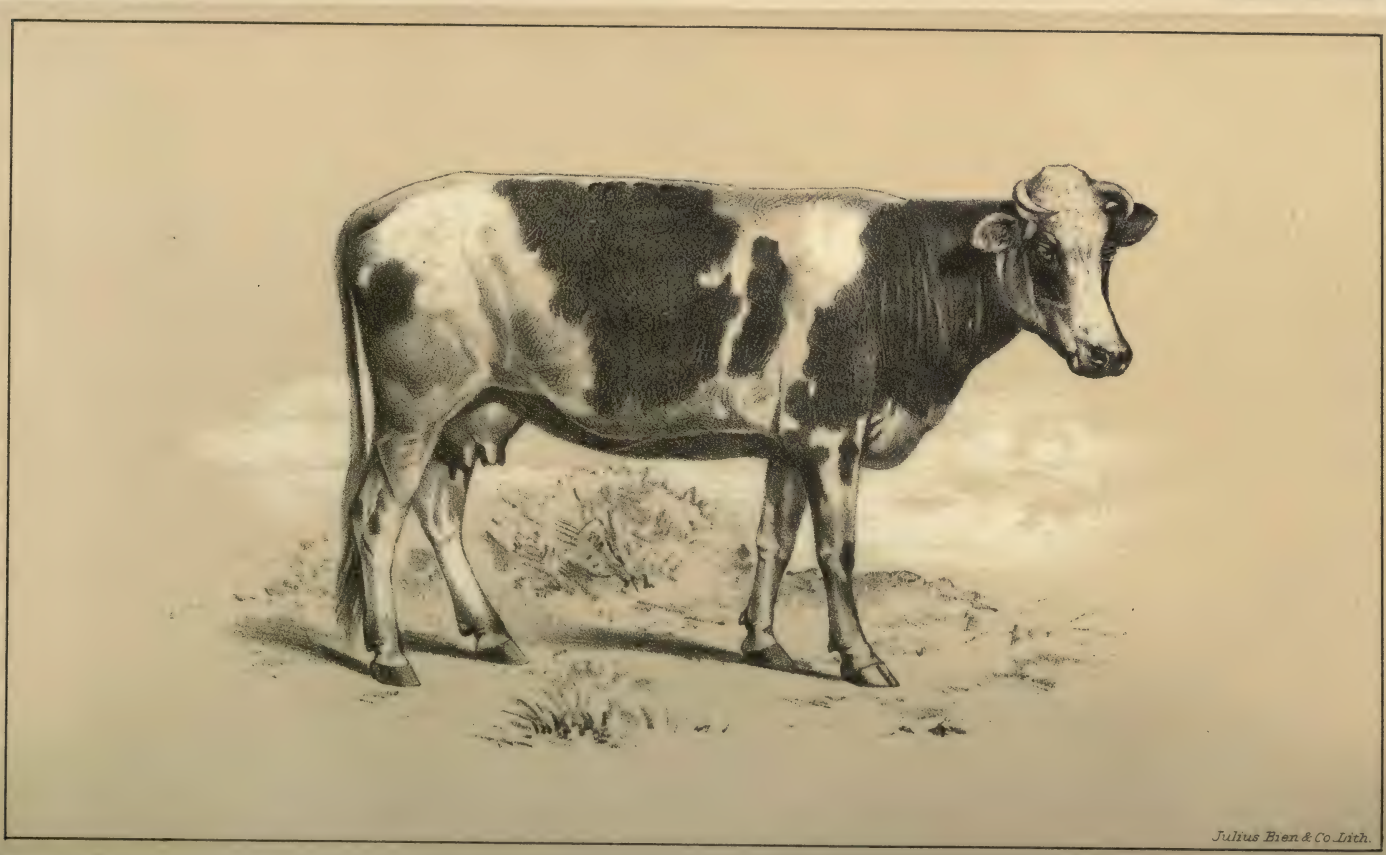


Julius Bien & Co. Lith.

COW "MANTOVA" OF THE FRIBURG (SWISS) BREED

11 YEARS OLD FROM THE ESTATE OF S. ROSSORE, BELONGING TO KING UMBERTO

PLATE 149

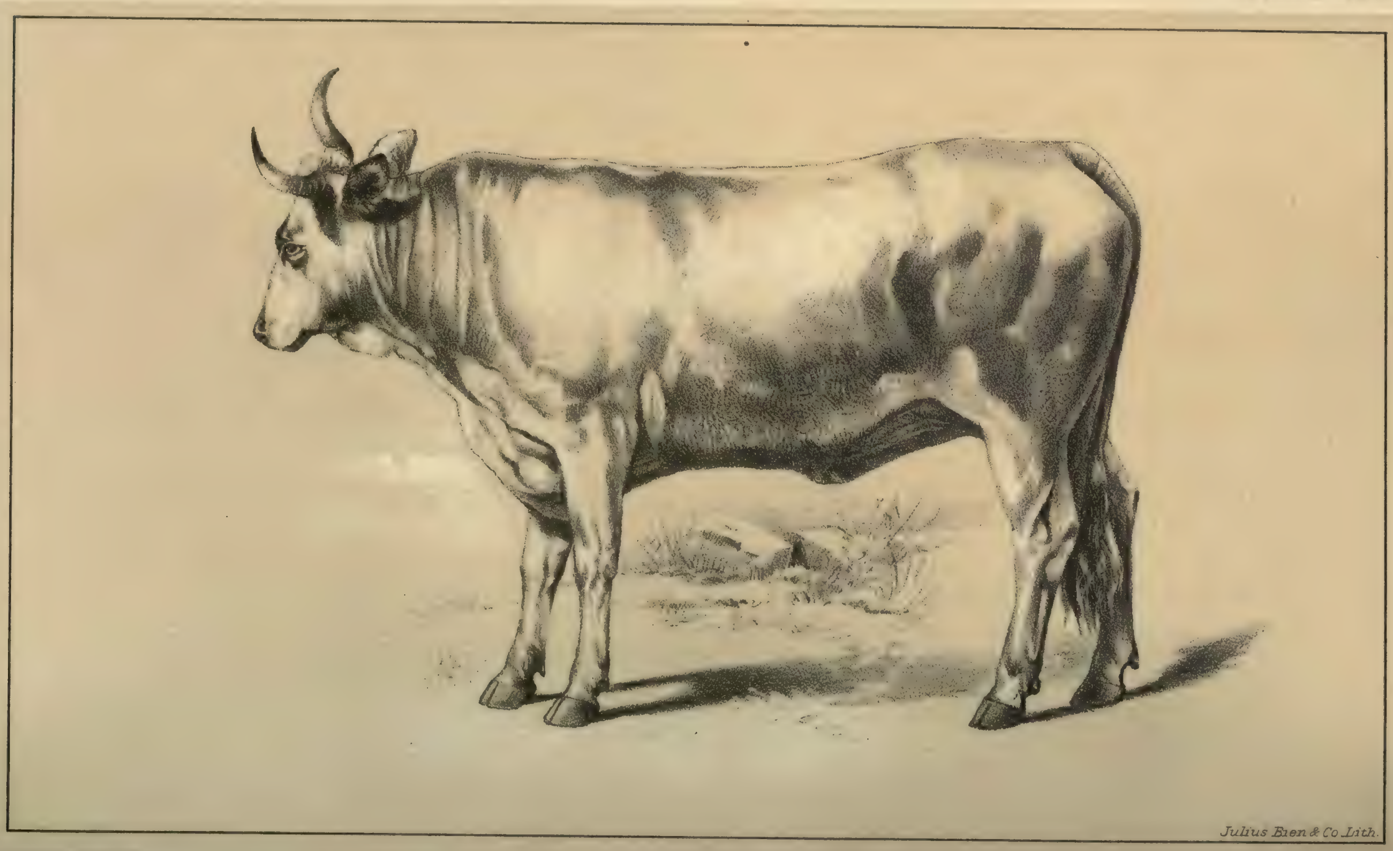


Julius Bien & Co. Lith.

HEIFER "ANVERSA" HOLLAND BREED.

EXHIBITED BY THE AGRICULTURAL SCHOOL OF BRESCIA AND AWARDED GOLD MEDAL

PLATE 150

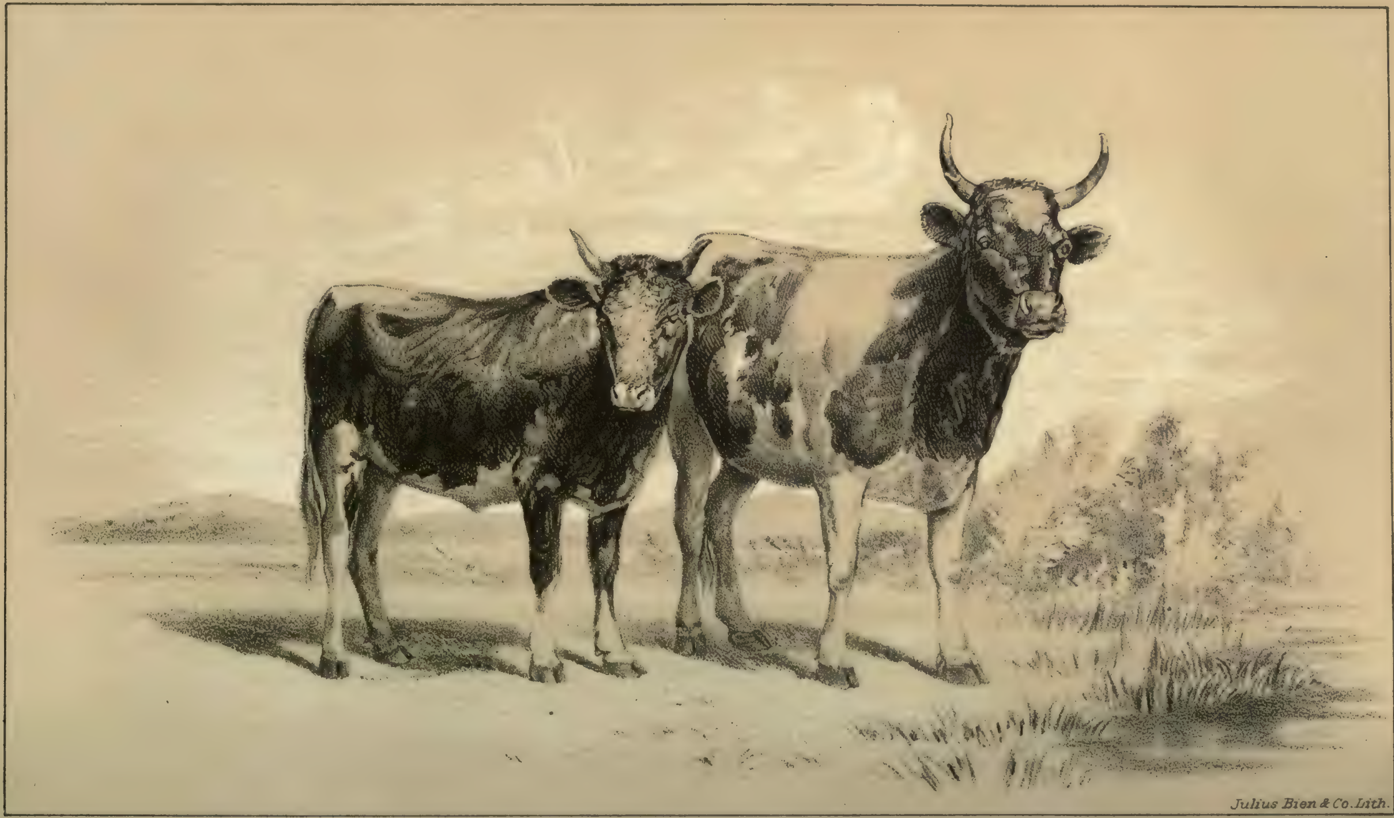


Julius Bien & Co Lith.

"FAUSTA", PUGLIESE BREED, 5 YEARS OLD.

EXHIBITED BY THE AGRICULTURAL SOCIETY OF

PLATE 151



Julius Bien & Co. Lith.

COWS "MINERVA" AND "CLOE" OF BRITTANY BREED

AWARDED SILVER MEDAL

summer is from 18° to 23° Réaumur, and in winter about 8° Réaumur, rarely falling to 3° Réaumur. The tufa referred to varies in thickness from 100 to 300 meters in depth, is rich in potash feldspar, and is covered with a luxuriant growth of wild grass.

Over this tract of land cattle of the buffalo race, the origin of which is unknown, roam in a semi-wild state. This race has never, to any extent, been crossed in breeding, but retains many peculiarities that render it exceedingly hard to manage. In color the cattle are black, or reddish black; are shaped somewhat like an ordinary cow, not so evenly, however, with short, round necks, large and curving horns, and with the rump somewhat larger and heavier than that of the ordinary cow.

The "Terra di Lavoro" contains about 12,000 of these cattle, bred mainly for the purpose of yielding milk for cheese-making. During the period of their milk-giving, and after they become useless for this purpose they are used before the plow or for other purposes which have in view the development of the soil. When they become unfit for such purposes they are turned over to the butcher. This occurs when they are about fourteen years old. Some are in the first instance fed for the butcher, and in such cases the meat is of the first quality, but in the majority of cases the meat of cattle whose lives are passed in the manner in which these buffaloes live is neither very tender nor very desirable.

The cheeses made from the milk of the buffalo cows are called "latticini." They are close and heavy in consistency; are sweet, and are consumed entirely within the limits of their production, being in no wise adapted for exportation.

There has been during the past ten years a slight increase in the stock of cattle referred to, an increase due in a measure to the increase in the demand for cheese and meat. In the section of the country towards Rome there has been a diminution, due to the cultivation of the soil, by reason of which the cattle have lost their natural food and have decreased in numbers, as, I am informed, multiplication depends very much upon the character of the food they receive.

As a race the buffaloes have never been closely studied. Within the memory of the present proprietors of the cattle lands no improvement has been made in the breed of the animals, and none have been exported, except a few to Sicily yearly. The question of exportation is deemed to be full of difficulties, and the proprietors do not deem it of advantage to them to attempt to send these cattle abroad. They are at times exceedingly wild, and consequently difficult to manage. In spite of this they are productive, and the result is remunerative. In some cases there have been crossings with a breed of Swiss cows from the neighborhood of Bern, Switzerland, which are best adapted to the furnishing of milk for butter-making. These cattle are found in the Piano of Salerno, and are, I learn, exported yearly in large numbers.

The buffaloes arrive at maturity when about three years of age; then the size of the buffalo bull is about 1 meter and 80 centimeters; that of the ox the same, and that of the cow about 1 meter and 60 centimeters. The weights thereof at maturity are about as follows: Bull, 2,000 pounds; ox, 2,000 pounds; cow, from 1,600 to 1,700 pounds. The yield of milk averages about 14 liters a day from each cow, when the buffalo calf does not draw upon the mother for its supply of nourishment. About 15 liters of milk make 3 kilos of cheese, containing all the butter from the milk and being very rich and exceedingly heavy. The buffaloes require little care, and in fact they get but little. They are never fastened, and are not housed except in very severe weather, and in such event the protection is such as only a heavy shed will afford. Their food is the wild grass of the "Campagna" or "Terra di Lavoro," together with a little hay at times, which is thrown upon the bushes that it may not be trampled under foot. It is thought best that the calving should occur in the autumn rather than in spring, as the supply of milk is needed for the winter cheeses, during which latter season the manufacture and consumption thereof are the largest.

The method of packing the cheeses for consumption is exceedingly simple. They are worked into forms of convenient size, generally weighing from 2 to 3 pounds, and then packed in leaves and placed in strong wicker baskets.

The buffalo bull and cow when young are estimated to be worth about 600 francs; when full grown, from 800 to 900 francs.

EXPORT TO THE UNITED STATES.

In case of their shipment to the United States, the best method would be by direct steamers to New York, a voyage of about twenty days. I am informed by the management of one of the steamship lines between Naples and New York that the cost of shipment would be $75 per head, which would include boxing, watering, and feeding during the voyage.

I submit herewith a sketch of the buffalo bull, drawn from life. It gives a fair idea of the animal, although not in itself a work of art. It is the best that could be done under the circumstances.

FRANK G. HAUGHWOUT,
Consul.

UNITED STATES CONSULATE,
Naples, February 26, 1884.

Special statistics concerning Italian buffalo cattle.

[Name of breed: Buffalo.]

Animals.	Size at maturity.	Live weight.
	Meters.	*Pounds.*
Cow	1.60	1,600 to 1,700
Bull	1.80	2,000
Ox	1.80	2,000

Average quantity of milk: About 14 liters per day. A liter equals about 2¼ pounds.

Milk to pounds of cheese: Fifteen liters of milk make 3 kilograms, or 6⅗ pounds, of cheese.

Name of country: Terra di Lavoro, Italy.

Age at maturity: Three years.

Weight of meat at maturity: As near as can be ascertained, the meat when fully prepared by butcher weighs 450 to 500 pounds.

Color: Black or reddish black.

Description: Shaped like ordinary cow; short, round neck; large and curving horns; rump larger than ordinary cow.

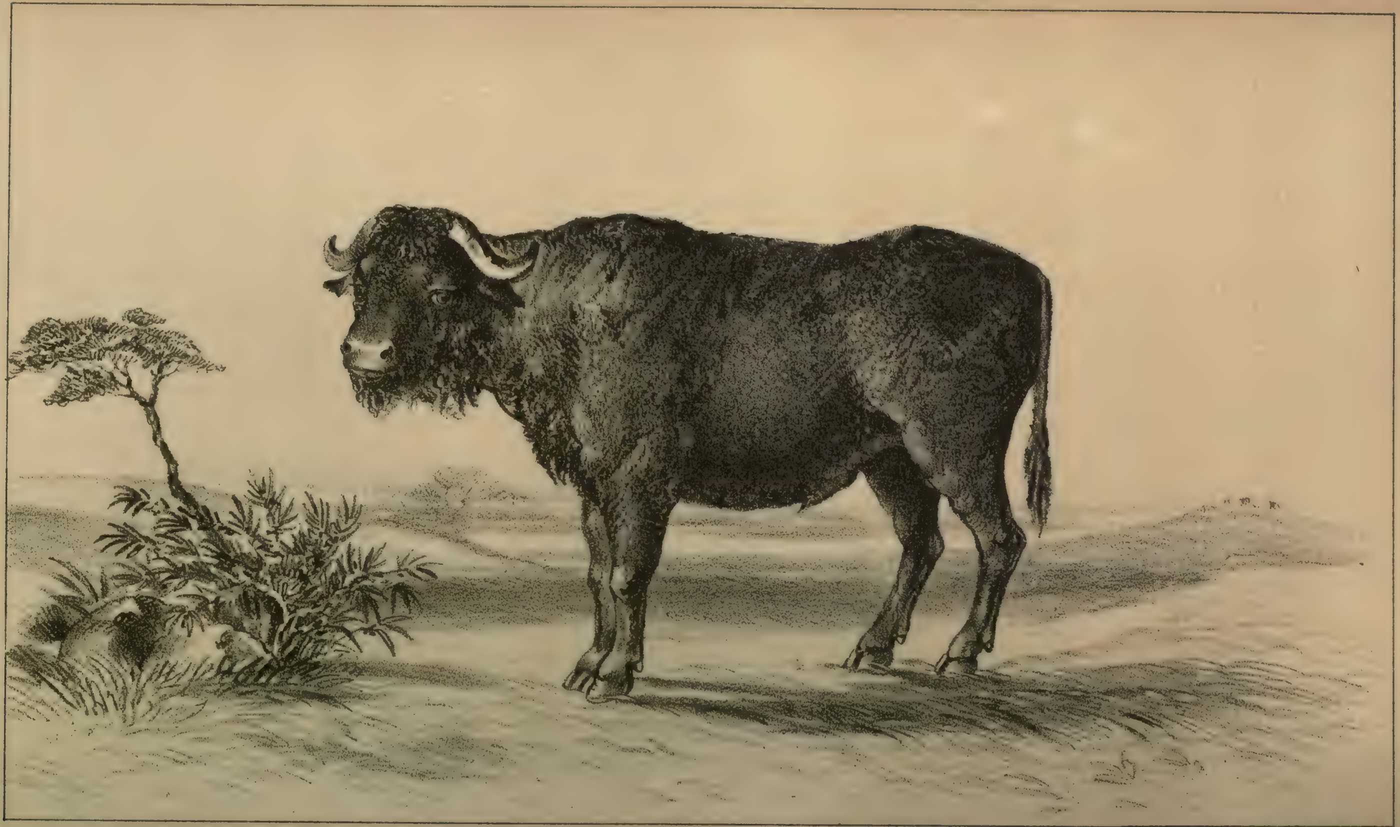
PRODUCT.—*Labor:* Farm work to slight extent. *Meat:* Not generally good for meat market. *Milk:* Used for cheese making. *Cheese:* Entire amount of milk used to make heavy, rich, white cheese.

Altitude: About 100 feet.

Temperature in summer: 18° to 20° Réaumur; *in winter,* 8° Réaumur.

Substratum: Clay resting on limestone bed.

PLATE 152



Julius Bien & Co. Lith.

BUFFALO D'ITALIA

Methods of housing: No special method used. In case of severe weather the cattle have the protection of a heavy shed.
Feeding: Wild grass of Campagna. Occasionally a little hay.
Breeding: No special method used. Cows calve in autumn.
Handling products: Cheese packed in leaves and in wicker baskets and consumed at home.

CATTLE IN PIEDMONT.

REPORT BY VICE-CONSUL DEZEYK, OF TURIN.

Detailed description of such domesticated animals as have proved by long experience to have been profitable in Piedmont, Italy, with information about the topography of the country and the composition of the soil.

Name of breed.	Annual average pounds of milk.	Milk to pounds of butter.	Milk to pounds of cheese.	Size at maturity.			Live weight.		
				Cow.	Bull.	Ox.	Cow.	Bull.	Ox.
							Lbs.	*Lbs.*	*Lbs.*
Piemontese	5,000	15	8½	Large	Large	Large	1,200	1,800	1,700
Mixed breeds	5,000	15	8½	do	do	do	1,000	1,300	1,100
Mountain breed	8,000	12	7½	Medium	Medium	Medium	1,000	1,300	1,100

Piemontese.—Five years at maturity; weight of meat, 60 per cent. of live weight; color, light gray; meat, good; milk, middling; cheese, good.
Mixed breeds.—Five years at maturity; weight of meat, 60 per cent. of live weight; color, light gray; meat, milk, and cheese, good.
Mountain breed.—Five years at maturity; weight of meat, 60 per cent. of live weight; color, brown, black, and white spotted; meat, milk, and cheese, good.

Topography.

Altitude.	Temperature.		
	Mean.	Summer.	Winter.
	° C.	° C.	° C.
Piedmont, 200 meters above the level of the sea	14 to 15	25 to 32	10 to 12
Mountains, 300 to 1,000 meters above the level of the sea	10 to 12	20 to 25	15 to 10

SOIL.—*Alluvial:* Piedmont. *Loam:* Collina. *Clay:* Monferrato, branch of Appenines. *Sandy, &c.:* Valley of Po.
SUBSTRATUM.—*Limestone:* The Piedmont hills in general, and those of Turin in particular. *Sandstone:* The district of Asti. *Clay:* Monferrato. *Gravel, &c.:* The valleys of Po, Tanaro, Dora, &c. *Granite:* The mountains. *Cultivated grasses:* *Timothy*, none; *clover*, abundant; *rye-grass, &c.*, moderate.
Methods of housing: Stabling in winter and pasturing in summer. *Feeding:* Hay and grass alternately. *Breeding:* Domestic. *Handling products:* Meat, butter, and cheese.

The "Pianura" pure breed would thrive well in corresponding states or latitudes; purchase price averages 800 francs for bulls; 600 francs for oxen; 500 francs for cows.

The best route for exportation is per railroad to Genoa and per steamship to New York.

The stock of cattle is steadily increasing in Piedmont on account of its profitableness. The number bred by far surpasses the home demand, and the surplus is exported mostly to France for butchering purposes. During the first eleven months of 1883 there were exported from Italy to France 96,000 head of cattle (between calves and beef), and a like amount of sheep (between lamb and mutton). With the exception of some corned-beef in cans, no meat or dairy product of any kind is imported into this district from the United States.

The last census of 1882 gave the following figures of the number of cattle and of their adaptability in the four districts of Piedmont, respectively:

Animals.	Adaptedness.	Number.
District of Cuneo:		
Calves (male), under one and one-half years		29, 213
Calves (female), under one and one-half years		26, 287
Bulls	For work	20, 092
Oxen	do	33, 004
Cows	For work and milk	129, 441
District of Turin:		
Calves (male), under one and one-half years		26, 144
Calves (female), under one and one half years		38, 903
Bulls	All work and meat	1, 515
Oxen	do	22, 686
Cows	do	198, 783
District of Alexandria:		
Calves (male), under one and one-half years		23, 230
Calves (female), under one and one-half years		12, 163
Bulls	All work and meat	261
Oxen	do	61, 157
Cows	do	50, 264
District of Navarra:		
Calves (male), under one and one-half years		11, 452
Calves (female), under one and one-half years		22, 592
Bulls	One-third work	1, 033
Oxen	do	23, 745
Cows (two-thirds milk)	do	129 070
Total number of cattle in Piedmont in 1882		861, 035

A. J. DEZEYK,
Vice-Consul.

UNITED STATES CONSULATE,
Turin, January 10, 1884.

CATTLE IN TUSCANY.

REPORT BY CONSUL WELSH, OF FLORENCE.

In reply to the circular issued by the Department of State, dated July 18, 1883, I have the honor to submit the following report:

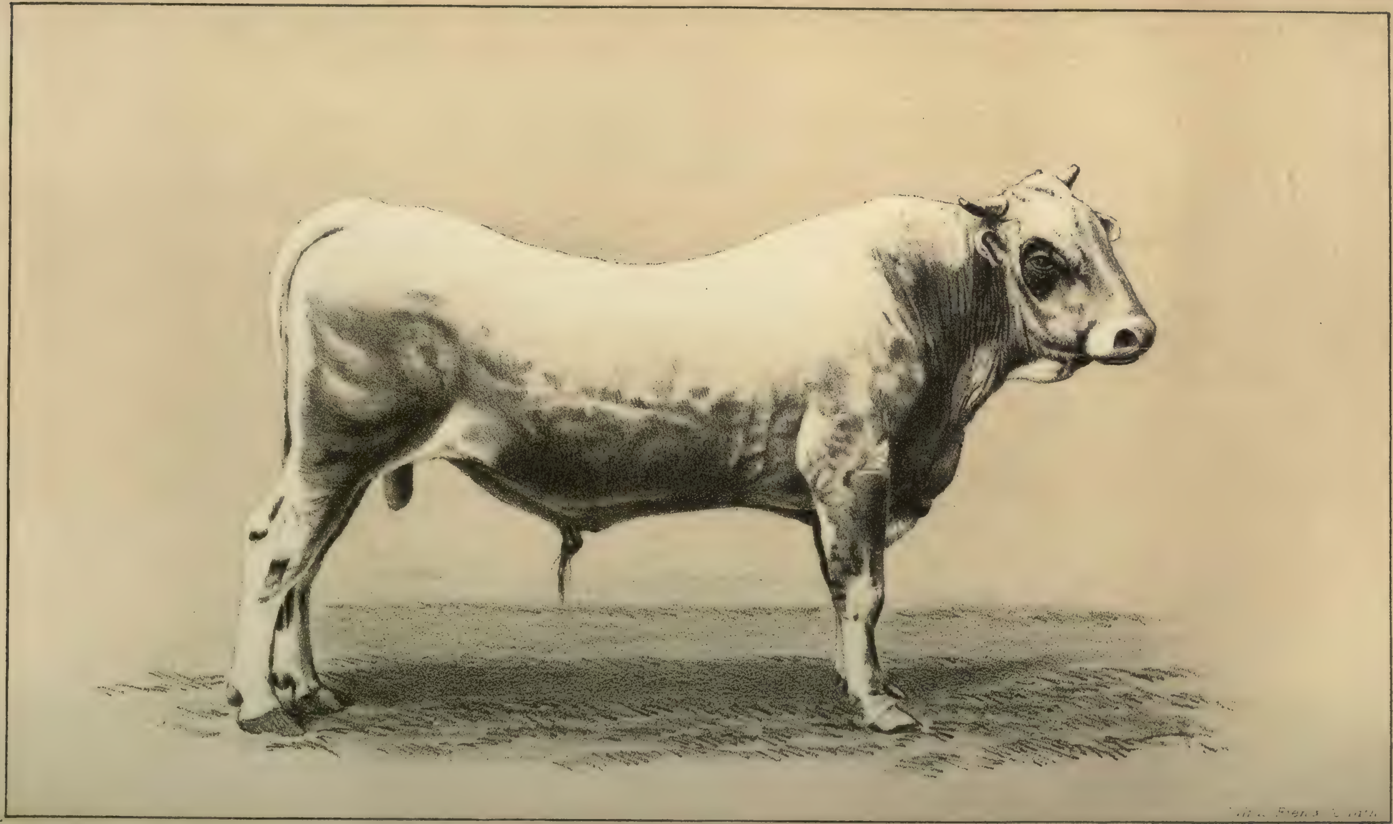
The breeds of horned cattle raised in Tuscany are five in number, and named respectively Chianina, Maremmana, Tiberina, Svizzera, and Montanina.

The Chianina, Maremmana, and Tiberina are descendants of the breed called Podolico, or Pugliese, from Puglia, in the south of Italy. The Svizzera, or Swiss breed, originated at Lugano, Switzerland, and the last, or Montanina, are hardy mountainous cattle of a nondescript origin.

THE CHIANINA BREED.

The breed called the Chianina, or the Val di Chiana, is the most valued in Tuscany for all purposes, whether for producing milk, beef, or powers of traction. A report on this breed was forwarded to the Depart-

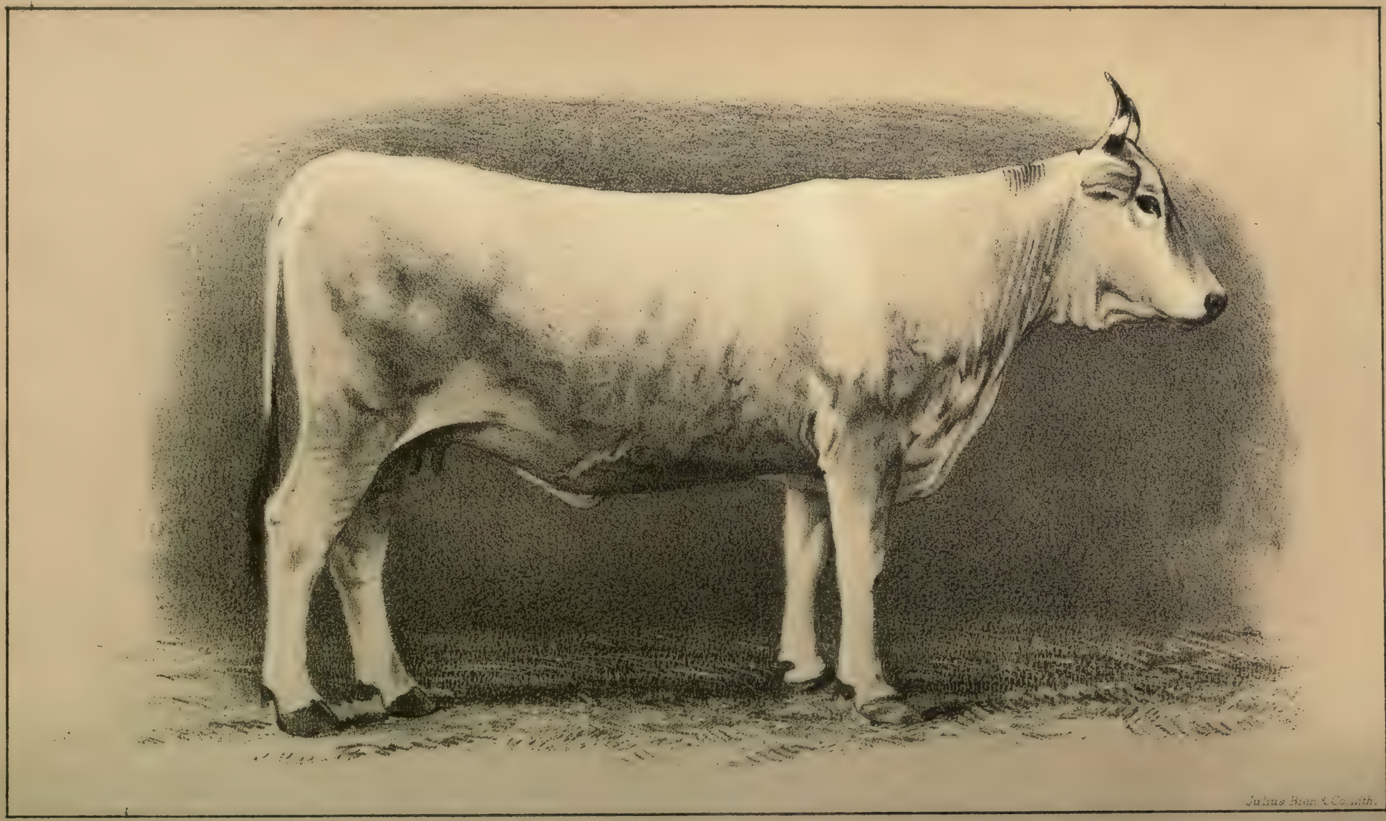
PLATE 153



Julius Bien & Co. Lith.

PIEDMONT BULL.

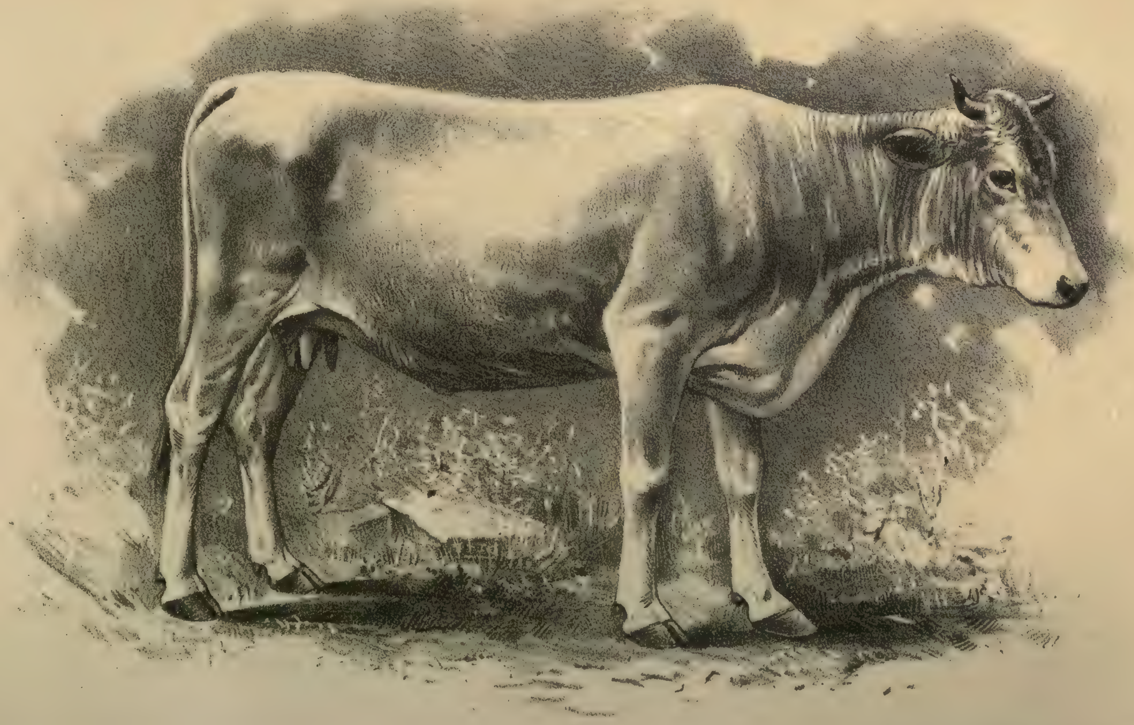
PLATE 154



Julius Bien & Co. lith.

PIEDMONT COW

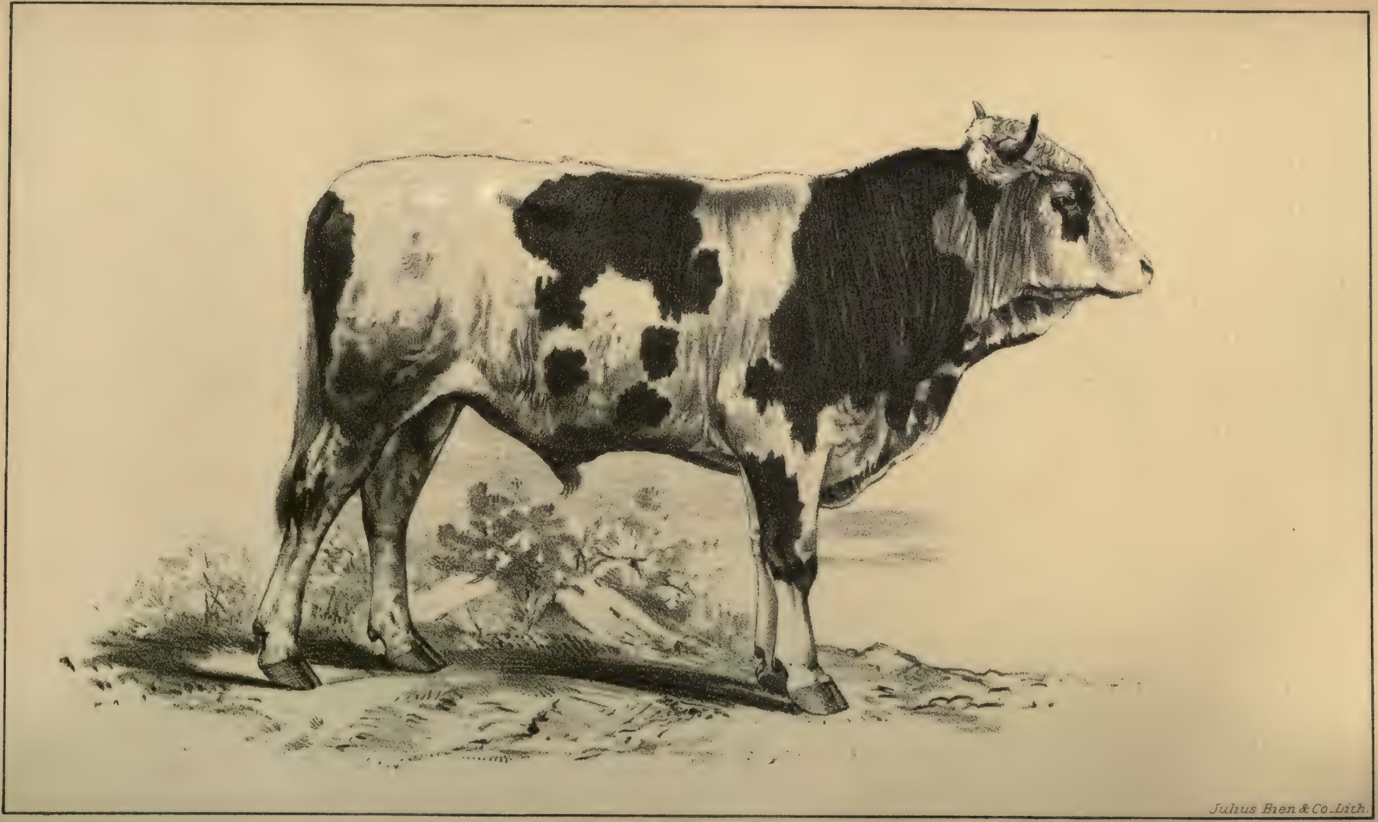
PLATE 155



Julius Bien & Co. Lith.

PIEDMONTESE COW

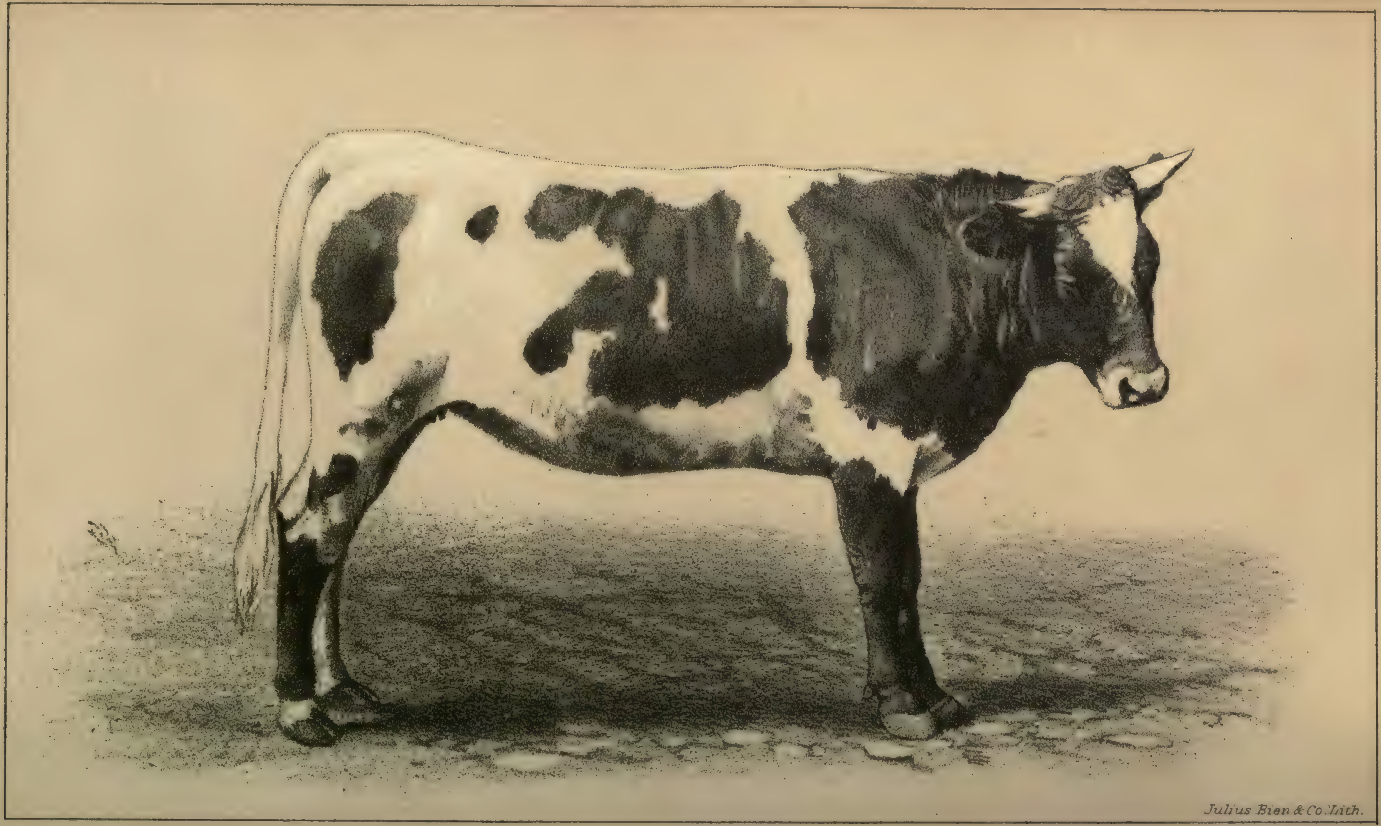
PLATE 156



Julius Bien & Co. Lith.

PIEDMONTESE MOUNTAIN BULL

PLATE 157



Julius Bien & Co. Lith.

PIEDMONTESE MOUNTAIN HEIFER

ment of State by my predecessor, Mr. J. Schuyler Crosby, on the 20th May, 1882, and as far as I can learn was in all points correct except as regards prices, which were too high.*

This, the Val di Chiana, I think the only breed in Tuscany worthy to be exported to the United States, unless perhaps a trial might be made with the Montanina, a very hardy class of cattle, and producing good milk on what they can pick up in the mountains; they are also good draft and fair beef cattle.

CATTLE OF THE VAL DI CHIANA.

The following is the substance of a letter received from the agent of Count Frassineto, who is the most important breeder and dealer in the Val di Chiana breed of cattle, and whose statements are entirely to be depended upon. The color of the Chianina cattle is white, with fine horns, and eyes pecurliarly bright and expressive. They are, indeed, very handsome.

A new-born calf weighs about 44 to 55 pounds, and at one year will weigh about 1,102 pounds and measure in height about 5 feet. The estimated price is $115 to $135.†

A bull two years old, measuring 5 feet 6 inches and weighing 1,763 pounds, would be about the average. He might bring $193.† A bull three years old measures 6 feet 3 inches and weighs about 2,204 pounds.

A calf after castration and arriving at the age of one year may weigh from 881 to 1,102 pounds, and measure 5 feet, being valued at $77.20. At two years this calf would measure about 5 feet 6 inches, weigh 1,543 pounds, and be valued at from $96 to $116. At three years it is considered an ox, would measure about 6 feet 3 inches, weigh about 2,204 pounds, and be worth from $135 to $154.

Heifers at one year weigh 882 pounds, and measure 4 feet 7 inches. At two years 1,323 pounds, and measure 5 feet 3 inches. At three years a heifer becomes a cow; size about 5 feet 3 inches to 5 feet 7 inches; weight about 1,543 pounds. The prices of cows are the same as for oxen.

Of this breed, both male and female arrive at the age of puberty when twenty months to two years old. The male serves well up to four years of age, the female to ten years and over. Oxen are yoked when about twenty months and generally endure six or seven years of work.

Feeding and housing.—In this district cattle are generally kept in stalls. They are fed as follows: Winter, a mash of turnips and hay with bean or corn flour thrown in, if the cattle are to be fattened. While working they are fed with hay alone with one portion of oats per day.

Bulls are higher fed; hay, turnips, and oats being freely given. To cows besides the usual food given to oxen, rye flour and flour of peas or beans are added. These latter increase the milk secretion.

During spring, summer, and autumn grasses are freely given; care, however, is to be taken not to mix the fresh food with the dried.

In regard to feeding, 6.61 pounds of fodder are needed daily for each 220 pounds of live weight. This for cattle being fattened and stall-fed. To fatten thoroughly, 11 pounds must be fed daily for every 220 pounds. For cattle at work or serving, 8 pounds for every 220 pounds per day.

---

* This report is published immediately following Consul Welsh's report.

† These prices, the consul says, are much overestimated.

TRANSPORT FEED.

While being transported, whether on land or sea, oats, beans, and, if possible, turnips should be used, good hay being always provided.

The straw needed for each head is from 5.51 to 6.61 pounds daily.

COST OF FODDER.

The cost of fodder is about as follows: Beans, $3.08 per 2.84 bushels; oats, $1.93 per 2.84 bushels; lupines, $1.93 per 2.84 bushels; beans, $3.47 per 220.46 pounds.

I am assured by Count Frassineto that where turnips are plenty this breed of cattle is sure to thrive.

CHIANINA BULLS.

The description of well-made bulls should be as follows: Back straight, neck thick, head small, horn white, finely shaped, with black tips; ears quite long, but well shaped; legs large and strong, but disposed to be knock-kneed; tail short; the entire color is white, with exception of muzzle and tip of tail black; the tongue dark; the barrel or body is well rounded and long, the chest full, hoofs not too straight. In general appearance the female differs little from the bull.

MAREMMANA CATTLE.

The Maremmana breed, generally of a gray and white speckled color, are to be found on the salt marshy plains of Volterra and on the clay ground in the vicinity of Sienna. They are a strong working cattle, but would not, I think, be apt to improve any breed in the United States, being in themselves almost mongrel. The Tiberina differ but little from the Maremmana.

SVIZZERA CATTLE.

The Svizzera breed, from Lugano, Switzerland, is only found in the vicinity of Pisa. The cattle are generally black in color and produce good beef, but are only medium workers or milk producers. Their importation can hardly be recommended.

TRANSPORTATION OF ITALIAN CATTLE TO THE UNITED STATES.

With regard to transportation to the United States, an actual or trustworthy estimate cannot be given unless the number of cattle is known. From Arezzo to the port of Leghorn the railroads transport ten head of cattle for about $15.

From Leghorn to New York the Anchor Line charges about $100 for mere transportation and the necessary water for one animal, and $75 each for any number not under ten. In case a number of cattle are to be shipped a portion of the "'tween decks" or, in summer time, the spar deck of a vessel, should be chartered, and the stalls or boxes built by the shipper.

I would always advise that the space necessary should be hired or chartered, whether on steamer or sailing vessel, and then the requisite stalls or boxes put up and furnished by the shipper, who should see that the attendants were men understanding the treatment of cattle at sea.

PURCHASING ITALIAN CATTLE FOR EXPORT.

No considerable quantity of cattle should be purchased unless through an agent thoroughly understanding—that is, practically knowing—cattle; an agent who can judge as to value, strength of constitution, &c., and one whose sympathies have not been engaged by the seller. The prices given here are always *first* prices; the last price can only be fixed upon by bargaining, and that should be done by a practical cattle dealer.

I append forms answering as near as possible the requirements of the circular.

WM. L. WELSH,
Consul.

UNITED STATES CONSULATE,
Florence, November 6, 1884.

Statement showing the cattle exports from Italy.

[Nearly all to France.]

To foreign countries.	Bulls and oxen.	Cows.	Heifers and calves.
1882	62, 639	19, 396	27, 937
1881	30, 877	11, 039	24, 028
Increase	31, 762	8, 357	3, 909

Special statistics concerning Tuscan cattle.

[Name of breed: Chianina.]

Animals.	Size at maturity.	Weight on the hoof.	Age at maturity.	Dead weight.
	Meters.	*Pounds.*		*Pounds.*
Cow	1. 70	1, 543	3	700
Bull	1. 90	2, 204	3	1, 500
Ox	1. 90	2, 204	3	1, 200

Annual average gallons of milk: 450 gallons yearly production of a cow after second delivery.

Milk to pounds of butter: 5 gallons milk to 2½ pounds of butter.

Milk to pounds of cheese: Sheep cheese alone is produced in Tuscany.

Name of country: Val di Chiana, Florence, Pisa.

Color: Silver-white mantle.

Description: Neck very thick, abundant mantle, small head, short and black muzzle, thin horns, long ears and flesh colored inside, strong and large legs, short tail, black tip.

Origin of breed: Modification of the Pudolico type or Pugliese, from Puglia (South Italy.

Labor: Enduring great amount of labor. In a farm managed by four men and two women (which is considered to be the average) oxen are put in the yoke 172 days in the year, viz: 53 winter, 13 spring, 44 summer, 62 autumn.

Meat: Making excellent beef, this kind of cattle being easily fattened.

Milk: A good cow will give about 1.50 gallons of milk a day; 5 gallons of this milk will make 2.2046 pounds butter.

Cheese: In the vicinity of Florence about three-fifths of the cattle are bred for the dairy and butcher.

Topography of Tuscany: Tuscany may be divided in four agrarian zones, viz: (1) Mountains with metals of secondary and eruptive formation, one-tenth; (2) Apennines of secondary and tertiary formation, four-tenths; (3) hills of a late tertiary formation, three-tenths; (4) plains of quaternary and alluvial formation, two-tenths.

Temperature: The climate, mild in winter and temperate in summer, is, notwithstanding, subject to chilly weather in the autumn and white frost in the spring. The yearly average temperature in Tuscany is between 14° and 16° centigrade; the mercury seldom falls below 7° below zero at Florence, 5° at Arezzo and Sienna, 3° at Lucca, and 2° at Pisa. Snow seldom falls, and never lasts long. The Apennines are, however, often covered with snow, and sometimes until the spring.

Soil: Alluvial. The soil is mountainous, the ground somewhere excessively stony, and in other regions refractory to good culture, owing to the abundance of clay.

Substratum.—Florence: Secondary, late tertiary, and quaternary formation. ***Pisa:*** Late tertiary, quaternary, and alluvial formation. *Sienna:* Secondary and tertiary formation of Cretaceous period. *Volterra:* Secondary and eruptive formation.

WHITE CATTLE OF TUSCANY.*

REPORT BY CONSUL CROSBY.

I have the honor to submit the following report regarding a very fine breed of Italian cattle, with the hope that it may prove useful in inducing some of our cattle breeders to introduce them into the United States.

For many centuries the Val di Chiana (Tuscany) has been celebrated for its white cattle, large in size, docile, and easily managed, capable of enduring great amount of work, and making excellent beef, they being very easily fattened. I have visited many of the estates and poderi for the purpose of examining these cattle, and certainly agree with the proprietors and farmers in their opinion that for working purposes and beef they are far superior to the Durham and Shorthorn breeds so popular in England and America. For milk and butter I do not recommend them. Bulls begin to serve heifers and cows from the age of two years up to four or five years, when they are slaughtered. Heifers are taken to the bull when twenty months old, and are usually bred to until eight to ten years old. Oxen, and heifers as well, are put in yoke when twenty months old, and are fit for work at the age of two years, and, unless injured, stand five years more of hard work, when they are usually stall-fed and slaughtered. About the same food and fodder are used for fattening as in the United States.

The following tabular form will show interesting details as to age, weight, and price:

Kind.	Age.	Height.	Weight.		Price.	
			From—	To—	From—	To—
			Pounds.	*Pounds.*		
Calf†	Birth		45	75		
	Six months	4 feet	330	450		
	One year	5 feet	880	1,100	$120 00	$140 00
Heifer	One year	5 feet 2 inches	880	1,000	80 00	100 00
Bull‡	Two years	5 feet 7 inches	1,550	1,750	200 00	
	Three years	6 feet 3 inches	1,550	2,200	250 00	300 00
Ox	Three years	6 feet 3 inches	1,850	2,200	140 00	160 00
Cow §	Three years	5 feet 2 inches	750	1,500	140 00	180 00

---

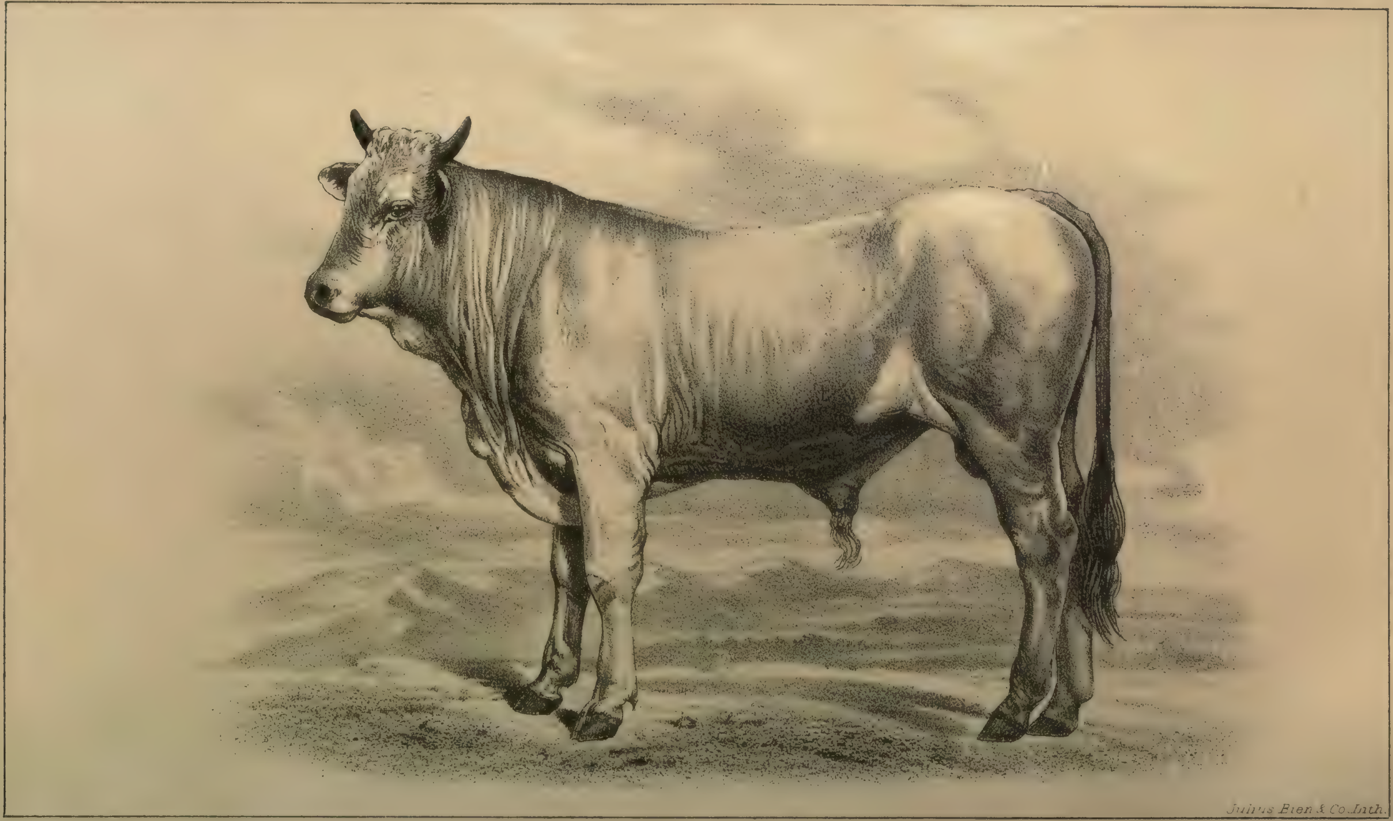
* Republished from Consular Reports, No. 17.

† Calves selected for working purposes are castrated at two months of age.

† Bulls four years old are kept apart for one month to fatten, and may increase 140 pounds weight and be sold at from $16 to $18 per cwt.

§ Cows eight or ten years old, no longer used for breeding, are kept three months for fattening, and are susceptible of 250 pounds increase in weight. Price, from $8 to $14 per cwt.

PLATE 158



Julius Bien & Co. Lith.

BULL "ADAM II"

ONE AND A HALF YEARS OLD OF THE CHIANINA

These cattle have very long and straight backs and well-rounded bodies; neck very thick, with abundant mantle; head light and clear cut, with short and thin horns; ears long and flesh-colored inside; legs rather large and strong, and placed well under; hoofs well proportioned, and not too straight; tail quite short, and black at the end. This black and silver color extends over the muzzle, along the back to the rump, when it ceases and appears again at the end of the tail. The color of the hair is a silver white, very thin, and abundant.

The principal markets for these white cattle are Arezzo, Castiglione, Fiorentino, and Tojano della Chiana in the province of Tuscany. Annual fairs are held, beginning after harvest time, about the middle of August, and generally increasing in importance until December.

I have made inquiries as to the cost of transportation by steamer from the nearest port, Leghorn, to New York, and in reply the agent of the Anchor Line informs me that $50 per head is charged, the shipper providing all fittings, stalls, boxes, fodder, and attendants, the ship only providing water. This line of steamers is very good and the cattle can be well accommodated on the upper deck. The length of voyage is about twenty-six days.

J. SCHUYLER CROSBY,
Consul.

UNITED STATES CONSULATE,
Florence, May 20, 1882.

CATTLE IN VENETIA.

REPORT BY CONSUL NOYES, OF VENICE.

GEOLOGICAL FORMATION OF VENETIA.

The Venetian territory would seem at first glance specially fitted by nature for a grazing country. The large proportion of its surface occupied by hills and mountains of moderate elevation, the abundance of its water courses, the nature of its soil, often of superior fertility, and everywhere good for forage, are all in its favor. These advantages, however, are subject to a serious drawback in the dry heat of the climate, unless the want of moisture be supplied by a generous irrigation to combat the danger of destructive drought. Without this the prosperity of live stock will always be uncertain and its multiplication limited.

An idea of the general character of the region is suggested by the fact that it contains a large part of the southern water-shed of the Alps, and several of their loftier peaks, together with the delta of the great north Italian rivers. Few portions of Europe offer such extreme contrasts of scenery and situation, and though the Italian climate and the community of an ancient civilization do much to soften the discordances of local influence, so completely opposed, there must still remain a great diversity in the conditions of life.

Geologists agree that the Alps were among the last upheavings of the primeval sea, and that their enormous masses are little else than the fossilized remains of its animal life. They also tell us that this upheaving was the result of intermittent volcanic action continued during the Tertiary period, and underlying the whole area of Italy; gradually subsiding to the north as the surface fixed into its present form, but showing its last extinct craters in the Roman Campagna, and its last eruptions at Vesuvius and Ætna.

Toward the close of the Tertiary and at the commencement of the Quaternary, the Venetian Alps presented very much the aspect of the Fiords of Norway—the sea washed their bases and penetrated into every opening to the foot of the great glaciers which descended between their precipitous spurs. The melting of these glaciers, with the altered temperature of the region, left in the deeper cavities the masses of imprisoned water which now form the Italian lakes, and with the dispersion of their abandoned moraines commenced the formation of the Lombard and Venetian plain.

The composition of this alluvion shows everywhere the material of the mountain sides from which it is derived. Its arrangement depends on the capricious action of the streams which transported it, as well as of great inundations, which have changed its whole surface at intervals. At its eastern limit, where the margin of plain grows narrower and slopes more rapidly to the sea, the variations of soil and surface become more frequent, as the rapid torrents change their course and deposit their coarser detritus in fresh localities, carrying their fine sediment to the lower levels, still half submerged by the Adriatic.

THE PROVINCE OF UDINE.

This narrow seaboard, with the broader region of the Carnic Alps stretching north and east to the Austrian frontier, forms the province of Udine, still known as the ancient Friuli.

It is composed, in the plain, of tracts of barren clay, passing into more fertile mixtures with calcareous matter, everywhere sown with gravel, beds of which occur constantly in the surface as underlying it at various depths. At a distance from the water courses the soil, with a smaller admixture of gravel, becomes more fertile. Along the lowest border are small tracts of rich alluvion, soon sinking into salt marsh, liable to inundation from the sea with the unusual persistence of a strong southeast wind. The mountainous portion of the province or Carnia is a confusion of narrow and sinuous valleys and irregular hillsides, with a considerable surface of vegetable earth in broken masses, mostly of schist and limestone, with rare apparitions of granite and tufa, affording tolerable pasture in nearly every part. A few of the summits of the region approach a height of 9,000 feet. Gemona, the principal town, stands at 932 feet above the sea, and villages are found at 2,100 feet.

The medium temperature is 18° to 20° C. in summer, 2° to 3° C. in winter, with a minimum of 15° C. in the last thirty-eight years. Rain and hail are frequent, and grow more so with the destruction of forests.

MOUNTAIN AND PASTURE LANDS OF UDINE.

All reports concur in stating the cultivated meadows at about one-sixth of the arable land in the plain, planted with lucern principally, and, unmanured or cared for, they give an average of forty quintals to the acre. These meadow grasses, lucern and clover, were only introduced here toward the beginning of the century, and their cultivation seems little understood. In the more fertile soil of the sea-side a better quality of forage and a more careful cultivation is found on the estates of a few large proprietors, and here the improvement of the stock has been pursued with growing interest. Some remarkable products are shown as the results of experiments commenced early in the century by the Princess Hacciocchi.

In the mountains the *cultivation* of forage is much more extensive, embracing about 30,000 to 40,000 acres, besides natural pasturage everywhere, in the valleys and lower hills excellent, of inferior quality in the heights. The whole of this region is full of busy pastoral life, but of the most primitive description, and far from prosperous as it should be with such facilities and more improved methods. Irrigation is rare, confined to cases where some mountain brook can be turned in a few fields, and manure all reserved, where it is possible, for the scanty plantation of cereals.

HERDING AND DAIRYING IN UDINE.

During the summer months some 25,000 head of cattle graze on these pastures, partly belonging to the district and partly to the plain below, the best tracts of pasture being rented by speculators, who make a business of conducting them to these heights, combining with this industry a considerable fabrication of dairy produce, receiving half the milk and product as the price of pasture and fabrication. The cheese is said to be excellent, and is of three kinds: Grasso fresco, di conserva, and curd or magro for consumption on the spot. This, with the butter, is largely demanded in the low country, where no production of the kind exists, and finds its way in smaller quantities to Venice and Trieste. The last official reports state the commercial aspect of their industry to be discouraging. In only one or two districts is there any satisfactory sale or demand. It is impossible to ascertain the proportions of milk and product, the proceeds being entirely primitive and rustic, with no attention to any system. The yield of milk is stated at 9 pounds per cow at the highest limit, and, with fresh pasture; later in the season or in advanced gestation, it descends to 7 and to 4 pounds. For cows without milk the price of pasture for the season (from June 1 to September 1) is $1.40; if under three years, $1; for calves, 60 cents.

CATTLE OF UDINE.

The cattle of these mountains are an indiscriminate mixture of all the races of the neighboring pastures—Tyrolese, Styrian, Carinthian, Bellanese—grafted in the domestic animal, vulgarly known as the *friulana*, largely represented here, but belonging more properly to the lower plain, and one of the numerous varieties of a race of animals now predominant in every part of Italy. The Polisine, Reggian, Pugliese, Roman, Tuscan, &c., all bear the persistent stamp of the same great family, modified by influences of climate and situation.

Professor Keller, of Padua, citing an authoritative work of Pabst, "Instruction and Guide to the Breeding of Horned Cattle," says: "Extending from the steppes of Eastern Europe and Asia, there is found in Podolia, the Ukraine, Volhynia, Hungary, Moldavia, Wallachia, Transylvania, and Southern Russia, a typical race, widely diffused, extremely apt for labor, fairly capable of fattening, yielding in particular abundant and excellent suet, but little milk. Spreading into regions so extended and various in soil, forage, and other conditions, one meets many gradations of this race differing in weight, physical constitution, &c. The essential differences which remain constant indicate two subdivisions, the Hungarian-Transylvanian and the Podolian-Moldere. The former is among the heaviest of existing races; the second is lower in stature, with shorter horns. As a rule, there is no worse race for the production of milk, but though in small quantity their milk is extremely rich, and in Hungary are occasionally found excellent milch cows. This deficiency may be explained by the fact that in their original home the animals are rarely or never milked. On the other hand, this race gives the best of animals for labor and is valuable for slaughter, not only for the superior quality of its flesh, but the abundance of suet in comparison with other races." The defects of this animal, more or less persistent in all modifications, besides the scarcity of milk, are: head too heavy, with a neck excessively long, depressed ribs, the back narrow, and the limbs long and ill furnished with muscle. This is the original type of most of the Italian races, and, more or less altered by long domestication and indiscriminate mixtures, it is the prevailing element of the stock of this region.

Another and less numerous group is found only here and in certain parts of the provinces of Parma and Piacenza, smaller than the above, with a uniform coat of red or reddish-brown, amber-colored horn and hoof, rose-tinted lip and nostril, and white eyelids. Showing no affinity with any of the Alpine or Podolian types, it is generally conjectured to be a relic of the aboriginal race, the *bos italicus* described by Latin authors and figured on ancient monuments. The animal at present is said to be inferior for fattening, fairly good for labor, with a tolerable yield of milk. Specimens were presented at the Universal Exhibition of Vienna in 1873, but were reported to possess no special merit of any kind, while open to objection for disadvantages and diversities of form and under size.

These animals seem to answer the present requirements of the country; with the broken and difficult nature of a large portion of its surface, the want of irrigation and the imperfect cultivation of the remainder, the region seems suited for animals of general usefulness, indifferent to hardships and privation.

IMPROVING UDINE CATTLE.

The spirit of improvement, however, is active and growing. The agricultural community are earnest in seeking the best means of improvement, and the essays so far made have been attended with a success which attracts general attention and interest. Independently of private experiments, the provincial administration has expended $10,000 during the last few years in the acquisition of choice reproducers, bulls and cows, afterward transferred to private breeders. The cross considered most successful so far is with the Swiss race of Freiburg.

The province just described is one of the largest in the kingdom, embracing all varieties of surface and a large portion of the Alps, which form its eastern extremity. It is mostly a pastoral region, but in the proportion of cattle to its surface ranks only sixth in the Venetian group, possessing 21.2 to the square kilometer, while the average is 25, with the same inferiority in the character of its races, and a greater variety of bastard and nondescript mixtures.

CATTLE IN TREVISO.

The adjoining inland province of Treviso falls below it both in number and quality of stock, offering only a wider field for the propagation of the same nameless medley of subraces, generally variations of the Podolian, which always seems to displace other animals in the hot and dry plains by a sort of natural survivance. This region, lying almost entirely in the plain, is in high cultivation. Its norther border, including the last foot-hills and slopes, and sheltered by the Alps, which here reach greater elevations, is specially suited by soil and southern exposure for vine growing. This is at present the prevailing interest of the province, and absorbs public attention to the prejudice of other improvements; so that cattle-breeding, which had never received much attention before, seems likely to receive still less in the future. It is complained that the present stock is not sufficient for manure, and hardly for tillage.

CATTLE IN THE PROVINCE OF BELLUNO.

The province of Belluno, extending north of this to the ridge of the Alps, is of more interest. Here nature has made pastoral industries a necessary resource for a large proportion of the inhabitants; and, pursued with increasing zeal and intelligence, they are gaining importance as a means of prosperity for a region proverbially destitute. Without the great summits or lofty plateaus of the central Alps, it belongs to that zone below the limit of eternal snow attached to the flank of every great mountain range, where the ridges become broken and tormented, and the torrents lose themselves in deep gorges, often more inhospitable than the broader elevations above. This region, known as the Dolomite Alps, is celebrated for the violence of its dislocations and the ravages of its streams and ancient glaciers, aided by the destructible material of its rocky masses. Nineteen of its peaks rise to a height of 9,200 feet, more or less; eleven surpass it, reaching an extreme of 10,266 feet. Vegetation ceases at 5,800 feet, human habitation at about 4,575, and cultivation at 4,000. Deposits of vegetable soil are rare and insecure, being always liable, even in the most favorable localities, to be swept off or buried under masses of gravel by the frequent inundations. Only about one-thirteenth part of the surface is capable of any kind of cultivation, the rest being largely occupied by forests, and, leaving out of calculation spaces of totally barren rock, five-sevenths of the whole is pasture land.

The lower and more cultivated valley, particularly that around Belluno and Feltre, the principal towns, offers a soil of moderate fertility, argillaceous calcareous, reposing on a varying substratum of marls, conglomerates, and coarse glacial detritus. In the rest of the province the calcareous element prevails more generally than in other parts of the Venetian territory, from the immense masses of dolomite limestone which crown all the mountains of the region, exposed in cliffs and walls, and which give it its striking character. These easily disaggregated masses, interrupted occasionally by volcanic irruptions of porphyry and beds of tufa, more rarely by deeper-lying masses of green and red sandstone or schist, form the geology of the mountains.

The climate, though softened by southern exposure and by the absence of great accumulations of snow during part of the year, has not the mild and equable temperature of the Venetian plain—the average ranges 3 degrees lower in the southern valleys, and in the higher districts has all the severity of alpine nature, with a medium temperature of 6.92° C. and snowfall of 146.4 C.

All these data suppose a rude pastoral life, merging into that of the neighboring Tyrol, of which the province is indeed but the southern extension, and the animals of the region bear the same stamp of relationship. The resemblance is so close that it is an unsettled question whether the type known as the Bellunese is not a simple modification of the Tyrolese. Both are of middling stature, with the coat of uniform color and short-curved horns; both are very much inferior to the Swiss as milk producers, with excellent qualities for labor and fattening; and the meat of both, with the same forage, has the same texture and flavor. Add to this the effect of contact and intermixture for so many centuries, and their present affinity hardly admits a doubt. The special traits of the Bellunese are a shorter head, with the ear much smaller, and the eye more prominent and vivacious, the chest broader, and the ribs more open and rounded. He is more short-coupled, with limbs shorter and thicker at the knees; his coat is more decidedly gray, while that of the Tyrolese is tawney and whitish, with a thicker and more porous skin, and the horns less robust and of a lighter tint of black. The Tyrolese cow gives rather more milk, but both races are docile and enduring for labor, while the Bellunese has a special tendency to fatten, and a remarkable precocity of development, attributed to the abundance of terrous oxides furnished by the rocks (dolomic and calcareous carbonates) of these mountains. At two years the bull is apt for pro creation; many assert that he is so at eighteen months; at the same age (two years) the ox is capable of hard labor, and at three years commands the highest price for slaughter; it is rarely the case that heifers are not impregnated before the end of the second year. It is quite possible that this precocity may not persist in the race when removed from its native locality, and it is liable to entail a corresponding tendence to early decline.

Some breeders assert this animal to be superior to the Tyrolese, and propose to adopt it as the type best suited to the region, improving it by selection, without further mixture of foreign blood, unless perhaps with the view to obtain a better yield of milk in certain districts. A bull of this race has been installed as official reproducer by the agricultural board of Conegliano and the surrounding region in the neighboring province of Treviso, and others are to be found in Padua and Vicenza. In the meanwhile the commercial importance of the stock is attested by the growing demand both for labor and slaughter in various parts of Italy, and the sale and exportation of nearly all the annual production of beeves and bullocks, together with a sixth of the cows.

The whole subject of breeding and treatment is becoming the dominant interest of the community. The provincial administration maintains four veterinary stations at different points, where competent specialists not only superintend the management of animals and report on their condition, but hold a school for instructing the population in the best modes of care and management. Private proprietors are paying more attention to the improvement of their stock, and reproducing stations, maintained by communal authorities, are becoming frequent. The Government in Italy does not implant such stations directly, but encourages their creation by prizes and subsidies to the ingrative of individuals or associations. The same zeal is shown in the construction of stables on a better system to replace the pestilential hovels where the animals and the peasant family formerly sought shelter and warmth together, at the expense of health in the long winters, as well as of sheds necessary for protection in the bleak mountain pastures.

An indication of the progress made is found in the expressions used in an inquest formerly made on the subject under the Austrian Government, speaking of the cattle of Belluno; "These animals in four or five years' time reach only a middling size, and are not susceptible of further growth without choice and costly food. The traders of the department of the Tagliamento (Udine) buy both oxen and cows, which, transported to a region of more succulent forage, resume their growth, and give a large profit to the purchaser. In consequence the district, although possessing an inferior race, is always sure of a ready sale for it."

Under the title "forage" occurs the following: "Some few farmers have commenced the cultivation of lucern (*medica*). The peasants find great difficulty in drying this grass so as to prevent the pulverization of the leaves, a difficulty they cannot surmount for want of an acquaintance with the proper method of proceeding in the case." These short quotations comment each other; at present lucern and clover are cultivated wherever cultivation of any kind is possible, though the product is still far from large. In elevated regions they are replaced by natural forage so wholesome, nourishing, and aromatic as to render the extension of artificial meadows almost useless.

The plants which occur most frequently in these mountain pastures are, *Phleum alpinum*, *Alopecurus gerardi*, *Agrostis canina*, *Sislesia cærulea*, *Poa alpina*, *Festuca duriuscula*, *Kœleria grandiflora*, *Trisetum flavescens*, *Aira flexuosa*, *Agrostis vulgaris*, *Nardus aristata*, and in still more elevated positions the *Agrostis alpina* and *rupestris*, and the *Arena scheuchzeri*.

The arable surface of the province is 30,000 acres, and that producing forage of all kinds, 175,000; of which temporary cultivated meadows take up 8,000; permanently cultivated, 42,000; natural pastures, 124,000.

Finally it may be said that the cattle of this province appear to be assuming the consistent and distinctive character of a special race, sought and imported as such into the surrounding region. Whether it will supplant the Tyrolese, so generally resorted to for breeding and slaughter, is doubtful. Whether it possesses merits sufficient to make it desirable for importation into the United States is more doubtful still, in presence of the pure Tyrolese, which seems to preserve in a higher degree its special race qualities.

DAIRYING IN BELLUNO.

Another effect of the same progressive impulse has been the introduction of a better system of dairy industry. The prevailing accounts from every quarter of this Venetian territory represent this class of production as being everywhere more or less neglected, or, at best, fabricated by the most antiquated methods to suit the rough taste of the country consumer, in most cases for family use only, and not of a quality to find a market abroad where there was a surplus to export. The modest export from the province of Udine has already been mentioned, and here, with the moderate product of milk and the scarcity of other resources, something more could be added to the economy of the region. This is now taking a practical form, thanks to the intelligence and energy of a parish priest of the valley of Agordo, who, in imitation of the Swiss "chaléts" and of the "fruiteries" of the French Jura, founded the first associated dairy, "Latteria Sociale," in his village in 1872. The idea was simple, and immediately realized a sensible advantage, and it has since extended as rapidly as could be expected in this isolated and difficult region. A community or a neighborhood contribute the modest means at their disposal for installing a boiler, a store-room, and the few necessary implements, the most improved possible, and employ an experienced practician to carry on the industry. They then bring in their surplus milk daily, of which a strict account is kept, and, at the end of the season, receive in exchange a proportionate share of the product, or, at choice, a credit on the establishment, which undertakes to dispose of the merchandise. The advantages are the profitable employment of much surplus milk, which would otherwise be lost or wasted, a more economical fabrication, and a better disposal of the product by the agency of the establishment.

A recent account estimates the gain thus realized on a hundred kilograms of milk about as follows:

One hundred kilograms of milk would give:

Articles.	Handled at home.		At the associated dairy.	
	Quantity.	Value.	Quantity.	Value.
	Kilos.		*Kilos.*	
Butter	3.00	$0 93	3.400	$1 41
Cheese	7.00	1 05	7.30	1 24
Curds	3.00	30	3.300	40
Total	....	2 28	....	3 05

Supposing the quantity of milk disposable to be about 24,000,000 of kilograms in the province, the product, amounting in the first case of home fabrication, to $547,200, would be increased by the "dairy" system to $735,360, a gain of $188,160.

In 1880 there existed forty of these dairies, in more or less prosperous operation, and public opinion favored their multiplication. It is supposed that at least two hundred and fifty of them would find advantageous conditions in the province. Some stress is laid on them here as representing the first introduction of co-operative industry of this kind in the region.

It is contested in some quarters, however, whether their products can ever compete for quality with those of Lombardy and Switzerland, on account of the inferior nature of the forage, and this drawback is apprehended by their promoters; but even if this be so, they will always find a large home and regional demand.

Operations and results of some associate dairies in the province of Belluno, for eight months, from October 1 *to May* 31.

Commune.	Number of cows.	Number of days.	Quantity of milk brought in.	Total product obtained.		
				Butter.	Cheese.	Curds.
			Kilos.	*Kilos.*	*Kilos.*	*Kilos.*
Agordo	215	165	112,519.000	3,613.000	7,960.000	2,820.000
Falcade	63	193	42,460.000	1,401.180	3,184.800	1,273.800
Canale	122	267	84,635.000	2,962.000	6,680.000	2,539.000
Vallada	17	90	6,452.000	197.000	499.000	174.000
Voltago	104	180	78,750.000	2,575.000	6,205.000	2,362.000
La Valle	115	293	93,889.100	3,293.700	6,795.000	2,485.500
Hurenzo	187	168	114,749.650	3,281.780	9,457.803	4,608.000
Hurenzo	49	146	26,930.850	744.710	2,078.680	1,126.320
Hurenzo	98	180	56,447.250	1,794.550	4,575.050	2,388.700
Hurenzo	188	187	119,947.450	3,058.660	9,655.770	4,677.850
Sosperolo	16	60	4,057.000	128.500	277.000	86.000
Forno Zoldo	72	31	7,049.600	238.769	527.000	250.500
Dolmegge	208	183	152,084.000	3,390.270	11,378.080	5,111.000
Pieave	95	210	78,155.150	1,844.850	5,882.550	2,875.050

Operations and results of some associate dairies, &c.—Continued.

Commune.	Selling prices.			Total value.	Product per 100 kilograms of milk.			Temperature of milk room.	Average number of hours before skimming.
	Butter.	Cheese.	Curds.		Butter.	Cheese.	Curds.		
	Lire.	*Lire.*	*Lire.*	*Lire.*	*Kilos.*	*Kilos.*	*Kilos.*	°C.	
Agordo	2.05	0.95	0.60	16,660.65	3.200	7.110	2.500	7.5	36
Falcade	2.00	0.95	0.73	6,757.80	3.300	7.500	3.000	8.0	36
Canale	2.00	1.40	0.70	17,065.00	3.500	8.000	3.000	8.0	30
Vallada	1.70	1.00	0.70	955.70	3.000	7.700	2.700	7.0	42
Voltago	2.12	0.95	0.60	12,770.95	3.300	7.900	3.000	7.0	36
La Vallo	2.07	0.92	0.53	14,387.30	3.510	7.240	2.648	5–15	30–24
Hurenzo	2.00	1.60	0.70	24,921.64	2.860	8.242	4.000	3–5	24–12
Hurenzo	2.00	1.60	0.75	5,660.06	2.780	7.720	4.190	5–6	24–12
Hurenzo	2.00	1.60	0.70	12,581.27	3.180	8.007	4.200	7.0	24–12
Hurenzo	2.00	1.30	0.70	21,944.31	2.550	8.050	3.900	7½	11
Sosperolo	1.90	1.00	0.70	581.35	3.160	6.830	2.116	8.0	18
Forno Zoldo	1.82	1.00	0.70	1,136.56	3.387	7.475	3.583	20.0	22–11
Dolmegge	1.90	1.50	0.60	26,500.23	2.220	7.430	3.350	......	12
Piave	2.00	1.35	0.55	13,171.92	2.360	7.500	3.680	10.0	20

NOTE.—By substituting pounds for kilograms in the columns of quantities, the relative results will be more speedily realized by the American reader.

PROVINCE OF VICENZA.

The region just described, embracing the valleys of the Piave and its confluents, is the only wholly Alpine and pastoral province of the territory. The Austrian frontier, now advancing suddenly southward to embrace the disputed Trentine valley, crosses the Brenta only 16 miles from entrance into the Venetian plain at Bassano, leaving the last mountain spurs to form, with the broad terrace at their feet, the province of Vicenza. The Brenta and the Astico, in close proximity at their sources, diverge immediately and inclose between them the Alpine portion of the province, the peculiar district known as the "Seven Communes," assigned by tradition as the refuge of the Cimbri, defeated by Marius, and inhabited at present by a population speaking an ancient Suabian dialect, a bleak plateau of about 48,000 acres, with a nearly uniform elevation of about 3,200 feet, girdled by mountains of from 6,000 to 7,000 feet, and its chief town, Asiago, 2,900 feet above the sea. Exposed to the prevailing northwest wind from the snows behind, the mean annual temperature is 7° C., with a maximum of +26°.1 and a minimum of —18, while the meeting of this cold current with the equally prevalent moist sirocco from the plain below causes an abundance of rain, unknown to any other part of Italy, a medium rainfall for three years of 1,703.9 millimeters toward the center, and of 2,019 at its southeastern border. This remarkable humidity and the excellent soil derived from the cretaceous and dolomitic masses, tufa and red sandstone of the surrounding peaks, produce a luxuriant growth of forest and pasture, and make this the grazing region of the whole province.

MOUNTAIN HERDING AND DAIRYING IN VICENZA.

The cattle of the lowland are driven here in great numbers to pass the summer months, and the irregular fabrication of dairy products during this "montication," as it is called, represents nearly all its industry of the kind, the plain being taken up with the cultivation of cereals. This mountain industry recalls that of Belluno, but in better conditions.

The pastures are excellent for air, topography, and herbage. The breed of cattle, not native, but a long-domesticated race of Tyrolese and Swiss, the cows of the district being Swiss and the best milkers in this part of Italy, the lowland cattle, an old stock crossed and recrossed with Tyrolese till the race has become general throughout all the northern part of the province. They are strong, thick-set animals, with small horns, short, thick neck, and muscular limbs; enduring, but slow and heavy in their movements; the coat whitish or light gray. The Swiss cows are much lower in stature, a darker gray in color, or spotted black and red according to their origin; not more than 4½ feet in height, with delicate limbs and voluminous dugs. Along with these domesticated Swiss cattle are numbers of more recent introduction belonging principally to the district of Vicenza, and modified from their primitive type by long residence there. Of a peculiar breed from the Val Rendana, where they are bred expressly for milking, they are known here as the cow of Schwytz. With a soft and pliable skin they have a coat spotted with brown and black; around the eyes, inside the ear, the line of the back, and the dugs, white; with the hinder part larger and heavier than the shoulders, and a height little over four feet; light-boned, with a small head and short horns. These cows have an extraordinary milking capacity, but very variable with the quality of their forage. In Switzerland they are said to give as much as 27 liters, or 7 gallons, per day. Here the same animal gives only 5, and her descendants 2 to 2½ at most.

Of these and the migratory herds from below, some 10,000 cattle are collected here during the summer months, of which 5,500 belong to the district, with 1,500 calves. They are guarded by the proprietor or tenant of the land, who undertakes their keeping either for a rate in money or a share in the products of a dairy attached to the pasture, which makes a part of the speculation. The milk of the herd is collected here twice a day, and being operated on in the best conditions of freshness and temperature, gives a large yield of butter and cheese much esteemed in the neighboring provinces. Ordinarily the price of pasturage, when taken in kind, is one-half of the milk and product; for cows without milk, $5 to $6, according to abundance and quality of forage. The yield of milk varies with the state of the pasture and of the animal, better and more abundant at the outset with grass uncropped and diminishing as the season advances. Averaging this difference, an ordinary cow is supposed to give 4 to 4¼ liters of milk per day.

BUTTER AND CHEESE MAKING IN VICENZA..

In 107 of these mountain dairies are made three kinds of cheese. For the "Grasso da frutta" the milk is used unskimmed and entire, and in the early season produces 33 pounds to the hundred liters=26½ gallons; later, 20–22. In one of these pastures, celebrated for the quality of its products, a small portion of butter must be removed, the excessive richness of the milk making the cheese difficult to keep. After this the "pecorino"—half cream—and the "magro," of skimmed milk, are made for the use of the neighborhood. Of "magro" a hundred liters of milk give about 22 pounds; each pound of butter taken from the milk lessens the yield of cheese by 2 pounds.

In full season the same quantity of milk gives 9½ pounds of butter, more or less, according to the quality of forage. The methods of fabrication are those of the farm-house, without a thermometer or other rational instrument, depending entirely on the tact and experience of the dairyman, but the material is so good and so liberally employed that these products furnish most of the lowland consumption, and are beginning to be sought in its markets for exportation. This district contains about 44,000 acres of natural pasture, with little cultivation of any kind, the rest of its surface being covered by forests.

DAIRYING IN THE LOWLANDS OF VICENZA.

Here and in the lower province the cows, during the autumn, winter, and spring, give little more than a half ration of milk, and the insignificant production of half-skimmed mezzo-magro cheese is consumed at home. They are kept, in the lowland districts, mostly in the stable by the proprietor or by an industréal, who follows up his trade in the mountains, rents the cow-house and buys forage of some farmer short of cattle on a singular traditional contract, which gives him right of pasturage after the first cutting, straw at discretion, about a cord of wood and 150 faggots for every 12 loads hay he buys, and 1 liter of wine every holiday. In return he gives all the manure at the end of the season, 1½ pounds of cheese, and the same weight of butter for each load of hay.

The cows are not fed on straw stubble or Indian corn leaves, as are beeves, but on grass and hay from natural meadows. These cow-houses are mostly confined to the district of Vicenza, and are all very much on the same plan, a long, low construction, with a file of animals on each side, separated by low partitions of wood 3 feet 2 inches high and 5 feet 8 long, leaving between them a stall 6 feet 6 wide for two animals, with a flooring raised 6 or 8 inches from the alley of 5 feet wide down the middle; grated windows over the heads of the cattle, sometimes glazed in winter. The calves are tied up promiscuously at one end of the stable in a space left for the purpose.

All this lower section of the province, the summer residence of wealthy families from the neighboring cities, and containing an unusual number of their large estates, shows at once the benefit of such a class of proprietors, many of whom occupy themselves with the breeding of cattle, so that by their example as well as their immediate agency the breed of the country has been nearly transformed.

The climate of this region is one of the best tempered of the territory, free from the excessive humidity of the plateau above and less subject to the long droughts of the lower plain. The difference from that of the mountain district just described is strongly marked by the advance of from fifteen days to a month in the harvests.

At Vicenza the medium temperature is 54° F. for the year, with an ordinary cold of 20.1 at the lowest in winter, and an average heat of 87.1 for midsummer, and a very regular transition of seasons; injurious droughts rare, except in the most southern districts.

In the valley of the Brenta, the soil, mostly calcareous, is only of middling quality, but there is considerable cultivation of forage, and the breeding of cattle is followed with a care and intelligence that make Bassano, at the opening of the plain, an important cattle market, and the interest in this industry increases in descending to the neighboring province of Padua, which is its principal center for Venetia.

West of the Brenta the torrential impetuosity of the streams which traverse this intermediate region between plain and mountain, and particularly of the Astico, has accumulated a deposit of the glacial detritus of the upper valley, making the subsoil of this central portion of the province little more than a bed of stones and gravel, sometimes varied by a rough conglomerate of the same materials thinly covered by a layer of vegetable soil rarely reaching the depth of one-half yard, sterilized by the porous nature of the mass below, and by the frequence in certain localities of springs and subterranean streams. This quality of soil permits a considerable growth of forage, and the district of Thiene supports a number of cattle little inférior to that of districts more generally fertile.

The territory remaining to the west of this and forming the more elevated portions of the province of Verona offers the same general character, and may be regarded as an extension of the same region. Its alps show much the same broken stratification, with a predominance of cretaceous rocks, and more frequent irruptions of prismatic and amorphous basalt and basaltic tufa.

Beyond the Adige the transition to the Lombard plain is formed by the moraine of the great glacier which once occupied the bed of the lake of Garda, through whose confused masses of gravel and bowlders of all sorts and dimensions the emissary stream, the Mincio, has worn its bed, often deeply incased, toward the lowland of Mantua.

FROM MOUNTAIN TO LOWLAND STOCK-RAISING.

The soil of this province, a portion of the same alluvion, with the western part of that of Vicenza, formed by the confluents of the Adige, an elevated and rather undulated plain, is generally fertile, and being deposited by smaller streams, presents less broadly marked differences of composition in neighboring localities, always subject, however, to the general law that its materials are coarser and less mingled on higher levels toward the points where the streams, issuing from their mountain valley, deposit their heavier burden, carrying their finer sediment to form a deeper and richer soil below. A chemical analysis of the soil found at base of the hills, at nearly equidistant points of this region from east to west, will give an idea of the material which enter into its composition.

Ingredients.		Near Ronca to the east, basaltic.	Near Verona, calcareous.
Silicic acid	parts	70	45
Calcareous carbonate	do	....	28
Alumina	do	13	8
Organic matter	do	5	7.50
Ferric acid	do	4.50	6
Lime	do	3	....
Phosphate of potassa	do	2	....
Magnesia	do	1	1
Alkaline salts	do	....	2
Water and loss	do	1.50	2.50
Total		100	100

The same races already described are still in presence here, less mingled and incorporated than in the regions further east, partly because breeding has been less active and thorough, partly because the province of Verona extending farther into the bottom valley of the Po, the specially Italianized race of the "*Pugliese*" seems the only animal that holds his ground and still prevails almost exclusively.

In fact throughout the territory the whole subject of crossing and improving breeds is still disputed and uncertain. Some years since the provincial administration established several reproducing stations, but the results did not correspond to the considerable expense incurred, and the intervention of the authorities was transformed into a system of annual prizes for the encouragement of private enterprise, to be adjudged to the proprietors of the best bulls and their products at the regional cattle shows. This system seems to have answered better, and each year the animals offered for competition are more numerous and deserving.

The annual migration to the heights is practiced, but without system or regularity and in all other respects this region has no special feature of pastoral industry to command attention.

All this tract of country is occupied by an extensive cultivation of cereals often without intermission, the least possible space being allotted to forage, which is generally planted along with the grain. The extent of natural or permanent pasture is insignificent, and but a small proportion of the surface is allowed for temporary and artificial meadows by the more intelligent proprietors for the purpose of special breeding, or for the necessity of rotation, never exceeding one-fourth and averaging more generally one-tenth. In the lower districts of Verona from 5 to 8 per cent. of the surface is irrigated, an improvement much more rarely found further east.

In this exclusive cultivation of grain, which has been the fixed idea of Italian agriculture for some years past, cattle are only taken into account for the needs of labor and manure. As a food supply the ox has had, until recently, no practical importance, costing too much for the consumption of the labor alike in town and country, and finding but a limited demand for the few who could afford such luxury in the towns. By the rural laborer it was used at rare festivals only, and cases are cited of contadini who asserted that they had never tasted meat. The growing international demand shows its effects so far only in those districts where cattle production is a necessary resource, and there is found in passing from the highlands to the bottom valley a regular decrease of stock for a given area, four oxen being the average in the one case on a farm of 15 to 30 acres, while in the lower plain the same number serves for one of 40 to 55 acres. Here the only commercial product looked for is the sale of the calves, each cow bringing in this way an average gain of 120 lires=$24, and the calf, if not sold at the teat, must get his living on roadsides and ditches; if sold younger he brings only $15, and if better fed he is still less profitable, so that the average remains about the same.

In the same transit from north to south, and from hill to plain, takes place a gradual change of races, the Tyrolese, Swiss, and all their mixtures giving way to the Podolian, which here balances other types, and further on along the lower rivers and coast, and it may be said in the rest of Italy south of the Po, is the exclusive race of the country.

CATTLE IN THE PROVINCE OF PADUA.

This province is in every way the heart of the Venetian terra-firma, and its agriculture best represents the state of progress in the region. Its situation between plain and mountain gives an excellent average of soil. Superior wealth and culture render it more open to the possibilities of improvement, and the agrarian interests of the country at large gravitate here as to their natural center. The city of Padua is the principal cattle market of the surrounding provinces, and their breeding interests owe their prosperity in part to its neighborhood. The province is the best stocked of the territory, possessing 37 head to the square kilometer, while the general average is but 25. In the northern part of the province breeding and fattening for slaughter is pursued as a special industry, and to a degree of system and perfection not attempted in any other part of the country. The district of Cittadella in particular is reputed for its products, and uses every art to maintain their quality. Mention has been made of the improved character of the cattle industry in the valley of the Brenta as it descends toward the province of Padua, from Bassano, which is already a center of some importance; here, beyond the confine, is its culminating point. The district is not exceptionally fertile, and portions of it toward the west are wasted by the gravel of the Brenta. Around Cittadella, in the center, it is calcareous, argillaceous, with a calcareous subsoil, is tolerably well irrigated, and produces good forage. The western border, argillaceous, calcareous, silicious, is more perfectly irrigated, and the forage is considered superior. The remaining surface to the north and east is fair vegetable soil for every cultivation, but with a rather porous substratum. To the extreme south and southwest, where clay predominates both above and below, the land is especially good for rice and forage. The latest statistics give 11,262 head of cattle, with a rate of 1 animal to 2.6 acres; 2 in every 10 are reserved for slaughter. From 400 to 1,300 animals are fattened here annually, out of 3,000, the estimated number for the province.

HOW CATTLE ARE FATTENED IN PADUA.

The number of cattle enumerated as belonging to the district are here of no moment, as a certain quantity are purchased for fattening from abroad. The treatment adopted most usually to attain the result in the shortest and most economical way is thus described: It should be premised that all practicians do not make it a point to bring their products to a point of extreme obesity, and notable differences in this respect may be seen among animals offered in the market. With this qualification, the following is the method adopted by the most skillful and experienced breeders to arrive at a moderate result of weight and volume:

In winter, when fresh forage is wanting, the animals, with an average of 300 kilograms (pounds 660), after several days of entire repose, with ordinary treatment, are bled, in case their coat, by its want of softness and luster or any other symptom, should indicate the necessity. This being done, they are submitted to a regular and special régime, being fed with fine rich hay, clover, or the like. This is continued from one to two months, as the animals show more or less readiness to gain flesh. After this they are served with a ration of Indian corn shucks, softened in boiling water and sprinkled with linseed meal, in quantity, 11 to 13 pounds a day. During four months of this treatment two beeves consume about 3,520 pounds of choice forage and 1,100 pounds of linseed oil-cake, and attain a weight of 1,870 pounds. In the summer much the same method is followed, using, however, fresh forage, such as hay, grass in general, clover, medic, and the like, the oil-cake being omitted. Use is also made of the green tops of Indian corn, and of mulberry leaves, provided these last have not been touched by frost, and thus rendered unwholesome for the animals. This summer treatment lasts nearly as long, with about the same cost and the same economical result, as the winter treatment.

To obtain beeves of still higher quality the whole secret consists in prolonging the above treatment, and those who desire extra fine products keep the animals on régime as long as six or seven months or more. In such cases a pair of beeves will consume as much as 5,280 pounds of forage and 3,300 pounds of oil-cake, reaching a weight of 2,420 pounds.

I have alluded to the race of animals preferred here for fattening; generally and constantly the Tyrolese are thought, beyond comparison, better both for labor and slaughter in this region. The so-called Felbrini or Bellonisi are purchased, but relatively few, while the native stock, Pugliese, stand lowest; without doubt there are reasons for this, drawn from long experience. It is worthy of note that in general here, in opposition to the usage of other parts of the province, neither in the forage nor otherwise is the least particle of salt ever given to cattle; that they are curried and cleansed of every kind of filth, and their coats kept as lustrous as possible; that the stable is never entirely closed even in winter, in the belief that a constant supply of fresh air is indispensable to the animals. It is remarked that they succeed better in winter, as well in the quantity of flesh as in its flavor.

The usual practice of speculators in this industry is to content themselves with the moderate result of four or five months of the above treatment, the profits of the operation diminishing with a farther outlay; there exists, however, a sort of ambition with certain individuals to carry their products to the utmost perfection, even with lessened gain, and this emulation has done much, doubtless, to maintain the singular reputation of the locality, due in part also to the special quality of the forage. This is generally asserted, though no explanation is found of the superiority claimed.

A report from the intendant of one of the great proprietary families of the region makes a higher estimate. After stating the methods practiced in his neighborhood (sometimes much the same as those mentioned above) he continues:

> The animal to be fattened should be neither too young nor to old, say from six to eight years; his live weight at the moment of putting under treatment is commonly from 1,100 to 1,320 pounds. In three months he is at half-flesh, but to put him in full condition, after these three months on green food, three months more are necessary on dry forage.

During the three months of green feeding no dry forage is given; grass alone with tops and shucks of Indian corn, &c., and two daily drafts of warm water, with 1 kilogram of oil-cake (2.2 pounds). Afterward he receives about 33 pounds of dry forage divided into three rations, changing the quality at each meal; the hay should be of the first mowing; the oil-cake drafts to be continued with an addition of 17¼ pounds of oil-cake. The shucks in these last three months should be peeled and dried and given morning and evening, about 4½ pounds at a time.

An animal well fattened gains an addition of about one-half his original weight, attaining to from 1,650 to 1,980 pounds; the dead weight is calculated at about 30° less. Attention should be paid to the habits and temperament of the animal, perfect cleanliness of animal and stall, abundance of litter, and constant ventilation, however cold the weather, regular currying after each meal, and after the draft, fresh water to his thirst.

Differences of opinion exist among specialists in regard to the necessity of salt as an element of diet; practically, it seems immaterial here, owing, perhaps, to the nature of the forage, which in certain situations is known to absorb a considerable quantity of salt in its growth. A strong prejudice exists, among peasant breeders principally, against currying the animals while in process of fattening, under the persuasion that every disturbance of the cuticle interferes with their digestion, and particularly with the formation of suet; the substitute being to brush the back and head, around and between the horns, with a broom or coarse wisp of straw, an operation supposed to be specially agreeable to the animal, and thus to improve his appetite and digestion. The story is told of an illiterate proprietor, noted for his excellent products, often found in his stable extended between a pair of beeves and industriously scratching their backs to excite their appetites.

Together with, or in substitution for, the linseed-cake, the refuse of various other oily plants is used, especially the colza, said to be very nearly equal to linseed as food for cattle. Other plants of the same nature are hemp, poppy, cotton, sesame, &c.; they are all valuable for manure and often so used. It is asserted that after serving as food for animals they are no less useful, the fertilizing elements passing through the animal after serving their purpose of nutrition. (*Liebig.*) Little or no recourse is made to roots for cattle-feeding in this district, and the extremely scanty production would hardly furnish the supply. The linseed cake is considered equivalent as food to rather more than twice its weight of hay. While the general practice of breeders gives the preference to this particular plant, it is supposed that cotton seed, if available, might surpass it. Mention has also been made of mulberry leaves as a favorite article of food.

Primitive ensilage.—In the vine-growing districts, together with the fallen vine leaves, is commonly used the refuse of the wine press, the considerable residue of alcohol remaining being an excellent stimulant for fattening, though injurious in ordinary food. The mode of preparation is as follows: A round excavation in the earth, about 2 meters deep and wide, is filled with alternate layers 20 centimeters (=8 inches) thick (on a bottom layer of leaves) of "graspa" or press refuse, and vine and mulberry leaves, pressed down as tightly as possible, and covered with a "capello" or conical mass of earth, care being taken to draw a ridge of earth around the brink to prevent rain or snow from penetrating. The mass is then left to ferment, and watched, to fill any crevices in the cover of earth as it dries. In about forty days fermentation is completed, and the product is then given to the animals, which, after a first hesitation, become extravagantly fond of it, and the dose has to be regulated.

FOOD ANALYSES.

It is always observed that an animal fattens in longer or shorter time according to the origin of his forage; for instance, with the hay mowed here at Bolzonella, eight months are required for full flesh; with that of Citadella, six months; with that of Belvedere and Rosa, four months suffice.

A rough analysis of the hay grown near Citadella gives for one hundred parts of hay:

Azotated substances, 8.14, or digestible matter, 58.23.
Carbonated substances, 43.63, or indigestible matter, 27.18.
Ashes, 6.16, or water, 14.19.

The composition of colza compared to linseed is as follows:

Constituents.	Colza.	Linseed.
Proteinic substances	28.08	28.0
Fatty substances	9.5	10.0
Hydrated carburets	24.3	31.0
Wood fiber	15.8	11.0
Ashes	7.4	7.0
Water	15.0	14.7

HOUSING CATTLE IN PADUA.

Breeders complain that the principal obstacle to fattening cattle up to the highest point is the impossibility of obtaining remuneration, the meat finding no sale beyond a certain price, which varies little for all classes of product, while in England every quality has its price, thus gratifying the fastidious taste of the rich, and bringing animal food within the reach of a large population to whom in Italy it is now forbidden. It is the construction and management of stables which seem most in need of improvement here at present. Where there is any solid construction it is a model of centuries gone and often dates as far back. In the southern part of this and in contiguous provinces this may be tolerated, with the dry and equable climate, and the race of cattle proof to hardship and capable of living in the open air without injury, though with more care they gain at once in appearance and condition, and in reality the stall is here more a convenience for purposes of order and special regimen than a necessity for shelter. So that improvement in this respect will be slow in spite of the exportations of progressists, with whom it is rather a favorite theme latterly. A few wealthy proprietors have constructed stables with all the modern requisites, but there is no instance of any such improvement for industrial purposes. As might be expected the best general average is found in the neighborhood of Padua and Cittadella. The usual plan is that described above in speaking of the cow-houses of Vicenza.

DAIRYING IN PADUA.

The dairy industry is entirely insignificant; in some districts it is wanting altogether; elsewhere it is confined to the needs of the household or village. In the districts of Cittadella alone statistical reports mention, besides six associate dairies, three families as producing small quantities for commerce; they prepare principally soft cheeses for the daily consumption of Padua.

The climate of the province is gentle and equable; separated from the lagoon only by the narrowest portion of that of Venice, it is in the same atmospheric conditions, with only the slight difference that, being entirely inland, the moderating effect of the sea is less sensible, the summer heats and the cold of winter being rather more marked.

The elevation of the city observatory is 93.6 feet above the sea. The temperature rarely exceeds 32° or 33° C. or falls below 3° C., with a medium of 148.° C. This is the ordinary year and a fair average for the province. Its lower portions sink into the deep valley of the Brenta and Adige, and assimilate in character to the adjoining province of Rovigo.

CATTLE IN THE PROVINCE OF ROVIGO.

Lying between the parallel courses of two great rivers, the Adige and the Po, probably the latest of all alluvial formations, still disputed by the water courses and the sea, this province forms a broader region set apart by nature from the districts which it divides, with a topography and an agriculture of its own. With most of its surface below the level of the rivers, which intersect it in every part, and liable also to invasion from the reflux of the tides driven by contrary winds, it must therefore he defended with constant vigilance. In portions drainage is almost impossible, and these are still left for salt marshes and meadows, in parts well reclaimed and defended; the soil, a deep alluvion, interrupted by intercolated beds of sand, peat, and gravel, is of exuberant fertility, and is occupied by an unsparing cultivation. This exclusive attention to plant products, with the prolonged heats that scorch neglected wastes of meager pasture between the frequent inundations, offer poor conditions for pastoral industry. Rovigo, one of the most elevated spots of the region, is 27½ feet above the sea; the medium temperature is 15° C., with a maximum of 33° .7 C., and a minimum of 3.7 and a rainfall of 0.80. Nature has furnished a race of cattle suited to such congenial conditions, and provided for their subsistence on the tracts of undrained land covered with canes, rushes, and marsh grasses along the sea-side and tide-water canals. The Pugliese exists and thrives here to the exclusion of other races, as well as in the lowest districts of the provinces of Padua and Venice. The noted agronomic, Professor Zanelli, mentions this type of animals as follows:

> Along both banks of the Po, descending from Mantua to the plains of Padua, and Polesine (Rovigo), we find a race of animals of labor, domesticated in the region, which it is impossible to confound with other types—oxen of tall and middle stature, more thick-set than the ordinary Hungarian breed, and distinguished by some with the name of Pugliese. Their special marks are the coat of gray or light grayish, with small black lines on the eyebrow, lips, and edge of the ear; long and sharp projecting horns give them rather a savage aspect. The shoulders are extremely developed in comparison with the haunches, with the point of the shoulder abnormally high and pronounced, a conformation well suited for a draft animal. This race has the advantage of being perfectly acclimated in these low and marshy plains, where the pasture is often of the most inferior quality, is robust and tenacious at work, for which cows and oxen are employed without distinction.

So that this animal, descending with the barbarian invaders from the steppes of the ancient Sarmatia (*Bos primigenus*), and now, by the consent of all authorities, diffused throughout the country from Lombardy to Sicily, is the proper Italian ox. He has been mentioned above as the inhabitant of Friuli; it is equally certain that the great oxen of Romaqua, the half savage herds of the Roman Campagna, and the cream-colored cattle of Tuscany, are of the same stock with the Pugliese of the Lower Po. The race in Piedmont attains extraordinary dimensions. In a report to Government are cited measurements of cattle three years old existing there; oxen of 6 feet 4 inches and 6 feet 6 inches, and a cow of 5 feet 6 inches in height.

Here their height rarely exceeds 5.6 to 6 feet, and their yield of meat is always inferior to that of races bred for slaughter, as well as of the Tyrolese which, besides, fatten more readily. On the other hand the type is susceptible of great improvement under favorable conditions, and a certain number of breeders here and in Romaqua maintain that it is the one best suited to the country. This may be true for the region now under consideration as well as for the rude husbandry and burning climate of Southern Italy, but under ordinary conditions of climate and cultivation in Europe, the controversy is practically decided by the choice of the breeders of Cittadella and wherever else superior cattle are required for industrial profit.

There can hardly be said to exist any management deserving attention after the elaborate methods followed in more advanced regions and described above. The ordinary practice is to leave the animals to find their subsistence on the coast lowlands, or otherwise to feed them on the indifferent products of these same pastures, at most shutting them in for the night in the huts of cane and thatch, which serve for stables in many localities. When fattening is required they receive the choicer forage grown promiscuously with the corn on small spaces of the arable land of the region.

In the western and slightly more elevated division of the province, toward Lendinara, where forage cultivation is somewhat more extended, occupying from one-fifth to one-tenth of the surface according to localities, with a yield of 70 to 80 quintals to the hectare, the animal improves greatly and is reported to give, without taking into account the cost of land and forage, 10 to 12 per cent. on his purchase price; in the lowland of Rovigo never more than 5 per cent.

Here there is also a trifling fabrication of cheese and butter for domestic use, limited, however, by the fear of stinting the calves, which are the principal care and reliance of the farmer.

In this region some steps of improvement are made in the construction of stables, a few of a better description having been introduced by the wealthier proprietors to replace older ones fallen into decay. The greater number, however, are still reported to maintain the prevailing aspect of neglect and rusticity.

CATTLE IN THE DISTRICT OF VENICE.

Of the region in the immediate dependence of the city little remains to be said; its various districts form so many appendages to the different provinces which incircle it and share the character of their rural life. Extremely fertile to the north, where it consists of the finer sediment of the Piave, it is stocked with the mixture of Austrian and Frivlona cattle which stock the adjoining districts of Udine and Treviso. The portions bordering the lagoon in the immediate neighborhood of Venice are occupied by cows kept expressly for the milk supply of the place, almost entirely of the Bellunese breed; indifferent milkers, but hardy and not fastidious in their nourishment. Some attempts have been made to introduce Swiss cows into this group, but on account of the objectionable quality of the water and forage they did not answer expectations.

The lower border of the lagoon, including Chioggia, is for all agricultural purposes a part of the low land of Rovigo, the Polesine just described, and contains the same exclusive stock of Pugliese cattle, though in number insufficient for the extended tracts of natural pasturage now utilized by large herds of mountain cattle from Belluno, which find here a cheap subsistence for the winter. In all this region no dairy industry is ever attempted, the native cows being used only for labor, and the scanty supply of milk and butter needed for home use furnished by the few cows of other races bred or imported for the purpose.

EFFECTS OF THE ITALIAN CLIMATE AND HERBAGE ON IMPORTED CATTLE.

It is significant for the object of the present inquiry that in every part of Northern Italy the fabrication of dairy products as an industry is only carried on with the aid of imported races. The Bellunese are a domesticated branch of Tyrolese, the milch cows of Vicenza and the seven communes are almost entirely Swiss, and both groups are such indifferent milk-givers that it would be impossible to bring their product into general or even local commerce without the advantage of mountain pastures at trifling cost. The Lombard dairymen, it is said, find it more profitable to import Swiss cows directly than to depend on crossing the breed, and it has been seen that the animals imported fall off immediately, so that the yield of milk never approaches that of a Swiss pasture.

All these facts point to a radical difference of local conditions, and the effect of this difference may be traced progressively. In leaving the moist climate and fresh pastures of England and Scotland every one may observe the dryer and more concentrated quality, as well as the darker color, of French beef and mutton, though not inferior in flavor. The verdure of the country shows the same variation; both have felt the long dry summer.

In Italy this change is exaggerated; prolonged heat in summer and dry cold in winter are the rule. Luxuriant pastures in hill or valley are rare, and keep their freshness but a moment. Mountain ranges and spurs occupy much of the surface; land is divided into the smallest parcels; horses too few and precious to be employed in cultivation; intensive agriculture is little known, and its introduction can only be the work of many years. Until then the race of cattle must be adapted to all uses, principally to labor, and subsidiarily to slaughter or dairy production; and even then it is doubtful whether the climate and vegetation could offer a congenial home for the ultra-refined and developed animals of more favored regions. Attempts to naturalize them, made with all the precautions and liberality of scientific experiment, have not so far succeeded.

THE OX OF THE COUNTRY.

In the Podolian ox the country possesses a type capable of supporting its mediocre conditions of existence, and answering its principal requirements; sober, robust, and nearly equal to the horse in the rapidity of his pace in labor or journey, he demands neither care nor shelter. To correct his defects of form and temperament the other half-Italianited race of the Tyrol seems specially fitted; indolent, slow, and massive in his native region, he loses the excess of these characteristics in changing his habitat, while retaining his precocity and readiness to fatten. The influence of climate is singular manifested in its effects in these extremes of race character, which, gaining and losing, respectively, by the change, tend to a common medium of good qualities. The Podolian, however, is the proper and universal Italian ox, and in view of the extraordinary modifications already noted of the same type, it is difficult to assign a limit to his capability of amelioration.

SUITABILITY OF ITALIAN CATTLE FOR THE UNITED STATES.

Whether one or other of these races would be desirable for importation to the United States would depend on the character and the agriculture of the region in which the animals should be implanted. Neither possesses the highly developed special qualities that are sought for in the improved cultivation of the older States. If, however, the precocity and solidity of the Tyrolese were considered an acquisition, these are found at their strongest in the valleys of the Upper Adige, toward Meran, the native home of the race. The type should be chosen there, and for these qualities alone; neither this nor any other race of these regions having any value for dairy purposes to merit attention.

The hardy and indefatigable Podolian or Pugliese might render useful service in the trying climate and difficult cultivation of less fertile and less advanced parts of the country, as, for instance, in the lowlands of the Gulf States, in the wild-sage region of the great plains, or the barren stretches of Lower California and New Mexico, and, according to the special requirements of the situation, there would be large room for choice among the several varieties of the race which stock the different regions of Italy.

PRICES OF ITALIAN CATTLE.

In regard to the quantity of cattle at present in the country and their price, they are reported to be scarce and dear in all parts of Italy and Venice, as well on account of the recent inundations as of the increasing demand, foreign and home. France and Germany require a constant supply, and for several years the Parisian market has been largely supplied with Italian beef.

Beeves of superior quality, live weight, cost from $15 to $16 the quintal, and this price is general throughout the region. The animal generally averages six quintals, and yields 50 per cent. net of meat. Cows bring about the same price, and never less than $14; at half-flesh the price is 55 to 60 francs, which equals $11 to $12.

TRANSPORTATION OF ITALIAN CATTLE TO THE UNITED STATES.

It is difficult to obtain data as to the cost and facilities of transport to the United States, the case never having before occurred. The best route would be by sea altogether, as I am assured that animals suffer more in the railway journey to Havre than in crossing the Atlantic. The General Navigation Company (Italian), with a line to New York and transshipment at Palermo, make their voyage from here to New York in twenty-five days, and state a price (approximate) of 480 francs ($96) per head, but better terms could be made according to number of animals. Each animal would require about 22 pounds of hay per day, and for the passage 550, which, at 71 cents per quintal, equals $3.50, which with $96 for transport, equals $99.50. The passage of the necessary keepers would be gratuitous.

MCWALTER B. NOYES,
Consul.

UNITED STATES CONSULATE,
Venice, November 24, 1883.

Size, weight, and product of horned cattle in the Venetian territory.

Name of breed.	Habitat.	Annual average pounds of milk.	Milk to pound of butter.	Milk to pound of cheese.	Size at maturity.		Live weight.	
					Cow.	Ox.	Cow.	Ox.
			Lbs.	*Lbs.*	*Ft.*	*Ft.*	*Lbs.*	*Lbs.*
Pugliese	Udine, Rovigo, Padua, Vicenza, Verona, Venice.	....	....	....	4.10	5½	935	1,400
Tyrolese	Udine, Vicenza, Padua, Verona.	3,000	$27\frac{7}{16}$	$13\frac{5}{8}$	4.8	5¼	990	1,650
Bellunese	Belluno, Padua, Udine, Treviso.	2,850	$27\frac{7}{16}$	$13\frac{5}{8}$	4.8	5	950	1,500
Schwytz	Vicenza	3,600	25	$11\frac{1}{16}$	......	......	......	......
Montanina	Udine	....	....	....	......	......	......	......

Breeds of horned cattle in the Venetian territory, and their products.

Name of breed.	Age at maturity.	Weight of meat at maturity.	Color.	Description.
	Yrs.	*Pounds.*		
Pugliese	4	710	Ash-gray, whitish, tipped with black.	Thin, high-shouldered, long-limbed, long-horned; pace, rapid.
Tyrolese	3	825	Gray or tawny	Heavy, slow, back straight, rump thick, head small, neck short, horns short.
Bellunese	2½	775	Gray, tipped with black	Thick-set, horns short, limbs short, breast broad, depression behind shoulder, precocious.
Schwytz	......	440	Red, brown, or black spotted	Low, head small, rump high and large, horns short, bones light, thighs large, skin soft.
Montanina	......	....	Red or brown	Undersized, horns and hoofs amber-color, light, rapid, used for transport.

Name of breed.	Origin of breed.	Labor.	Product.		
			Meat, fattened.	Milk, per year.	Cheese, per year.
			Lbs.	*Lbs.*	*Lbs.*
Pugliese	Steppes of Russia	Rapid	990	....	....
Tyrolese	Austrian Tyrol	Slow	1,100	3,000	219
Bellunese	Belluno and Tyrol	Good, middling	1,050	2,350	207
Schwytz	Val Rendana, Tyrol	....	....	3,600	262
Montanina	Italy	Middling rapid	....	....	....

Climate and topography of the Venetian territory.

Locality.	Altitude.	Mean annual temperature.	Summer.		Winter.	
			Mean.	Extreme.	Mean.	Extreme.
Udine:	*Meters.*	°C.	°C.	°C.	°C.	°C.
Gemona	200	11.1	20	33.8	2.8	−15
Pordenone	30	14.8	24.5	....	....	....
Cividale	....	....	....	....	....	....
Belluno:						
Belluno	404	10.3	20.6	31.9	....	−11.9
Agordo	....	10.1	....	....	....	....
Auronzo	900	6.9	16.6	29.6	−1.6	−17.5
Vicenza:						
Vicenza	35	13.3	24.7	35.1	....	− 5
Asiago	996	7	....	26.1	....	−18
Bassano	129	12.7	....	33.2	3.3	− 6.1
Verona:						
Verona	64	14.2	....	35	3.9	− 6.4
Sanguinetto	....	....	....	....	....	....
Padua:						
Padua	11	14.3	....	36.7	4.9	11.1
Cittadella	46	....	....	....	....	....
Piava	....	....	....	....	....	....
Rovigo:						
Lendinara	9	....	....	....	....	....
Adria	2	....	....	....	....	....
Ariano	1	....	....	....	....	....
Venice:						
St. Dona	....	....	....	....	....	....
Venice and Dolo	3	12.1	24.4	36.7	3.1	− 5
Chioggia	1.1	....	....	....	....	....

Climate and topography of the Venetian territory—Continued.

Locality.	Soil.	
	Character.	Composition.
Udine:		
Gemona	Alluvial	Siliceous, argillaceous, calcareous.
Pordenone	Alluvial and gravel	Gravel, argillaceous. calcareous.
Cividale	do	Argillaceous, calcareous, gravel.
Belluno:		
Belluno	Alluvial	Argillaceous, calcareous.
Agordo	Mountain shelves	Calcareous, argillaceous, sand.
Auronzo	do	Calcareous, argillaceous.
Vicenza:		
Vicenza	Alluvial and gravel	Argillaceous, siliceous, calcareous.
Asiago	Mountain plateau	Cretaceous, calcareous.
Bassano	Alluvian	Cretaceous, siliceous, calcareous.
Verona:		
Verona	Stony	Argillaceous, calcareous, siliceous.
Sanguinetto	Alluvial	Siliceous, argillaceous, calcareous.
Padua:		
Padua	Loam	Siliceous, argillaceous.
Cittadella	Alluvian	Argillaceous, calcareous, sand.
Piave	Deep alluvian	Argillaceous, siliceous.
Rovigo:		
Lendinara	Alluvial and sand	Argillaceous, sand, calcareous.
Adria	do	Argillaceous, sand, peat.
Ariano	do	Do.
Venice:		
St. Dona	do	Argillaceous.
Venice and Dolo	do	Argillaceous, sand.
Chioggia	do	Argillaceous, sand, peat.

NOTE.—1 meter = 3 feet 3.1 inches. Degree centigrade = 1° Fahrenheit. 0 centigrade is at freezing point.

Substratum and cultivated grasses in the Venetian territory.

Locality.	Substratum.	Proportion to arable soil.	Cultivated grasses.
Udine:			
Gemona	Limestone; in higher parts, granite and schist.	½	Medic and clover, most in mountain grasses.
Pordenone	Gravel, moraine	⅙	Medic, clover, rye-grass.
Cividale	Limestone and gravel, higher granite.	⅐	Rye-grass, medic of late years.
Belluno:			
Belluno	Limestone, green sandstone, marl, and conglomerates.	⅕	Medic, clover, rye-grass.
Agordo	Limestone, red sandstone, chalk, scaglia.	⅕	Rye-grass, clover, medic, native grasses.
Auronzo	Dolomite, arenaceous and calcareous schist, quartz porphyry.	......	Pastures of Phliune alponum, agrostis, alopecurus, poa, festuca, avena scheuchzin, &c.
Vicenza:			
Vicenza	Metamorphic lime and sand stone, dolerite and basalt tufa, gravel.	⅕	Clover, red and white, medic.
Asiago	Dolomite, red sandstone, chalk, basalt tufa.	......	Insignificant, $\frac{6}{10}$ in mountain pastures.
Bassano	Glacial detritus, tertiary limestone, basalt, tufa, chalk.	⅕	Medic, lucern, timothy, clover, vetches.
Verona:			
Verona	Numolite limestone, chalk, tufa, lignete, moraine.	......	Medic and clover, mostly natural pasture.
Sanguinetto	Sand, limestone, conglomerates.	⅙	$\frac{8}{100}$ irrigated, medic, clover, sainfrin.
Padua:			
Padua	Sand, gravel, trachyte, limestone, and conglomerates.	⅙	Timothy, medic, clover, many native grasses, phlium, poa, agrostic, many species of vetch.
Cittadella	Gravel, conglomerates	¼	Do.
Piavà	Alluvial, sand, clay, peat	......	Lucern, medic, clover, vast bottom pasture.
Rovigo:			
Lendinara	Gravel, recent conglomerates, clay.	⅛	Medic, clover, insuffioent for consumption.
Adria	Deep alluvial, sand, clay, peat alernating.	......	Mixed with other crops, medic, clover.
Ariano	Delta; clay, gravel, peat	......	Insignificant, mostly salt marsh.
Venice:			
San Dona	Delta; clay, argillaceous and cretaceous marl.	⅕	Very fertile, medic, clover, and bottom pasture.
Venice and Dolo	Sand, clay, marl, indurated clay.	......	Little cultivation, waste pasture, bad water.
Chioggia	Gravel, clay, sand, peat	......	Insignificant, waste and bottom pasture.

BELGIUM.

CATTLE IN BELGIUM.

REPORT BY CONSUL STEUART, OF ANTWERP.

In reply to the circular and memoranda calling for information relative to breeding cattle that would be of value to stock-breeders in the United States, I have to regret that my efforts, both by personal inquiry and by correspondence, to obtain some points of value bearing on the subject have been attended with indifferent results, some of my letters remaining unanswered.

Belgium offers no cattle for export, first, because the home demand is far in excess of the supply, and then because there is no race here sufficiently prominent or meritorious to attract the attention of the purchasers from the United States, who are almost always present in the neighboring kingdom of Holland seeking the valuable cattle in which that country is so rich.

From an official report published this year by the bureau of agriculture in the department of the interior at Brussels, we learn that for some years past the cattle in Belgium have shown great improvement, owing to the great care taken in the selection of the breeding stock brought into the country from England and Holland, and to the great attention paid to the offspring. They are well housed, carefully fed, and every care taken in order to produce the best results. The Durham bulls from England are the most valued and most in use, and the cross from this race are very successful, and becoming more and more numerous every year. In some places an effort has been made to preserve and breed the Durham stock pure, but the result was a failure. After two or three generations they degenerate so greatly that the infusion of new blood is necessary; thus, whilst the cross is a great success, the pure race will not thrive in this country.

The province of Antwerp prefers to improve her stock by the introduction of the Dutch race, because the dairy is the result aimed at, and but little attention paid to the other products. The cow is valued only by her milk-giving qualities, and for this purpose the Dutch are much the best.

In the province of Flanders the great proportion of the cattle are of the Cassel breed, or, as it is called in France and in all the markets, the Flemish breed. In many of the districts more than half the cows are of this breed, whilst in other districts the Durham is used to cross with the native cows, or with those brought in from Holland.

In the province of Brabant the Durham is held in the highest estimation, but in the weekly market held at Diest, which is a very important center for the cattle trade, the Holland cattle take a very important part.

As the home product falls far short of the demand for consumption, the Government has interested itself greatly, as it does in all matters affecting the material interests of the Kingdom, in order to secure the increase needed, and at the same time to improve the breed as much as possible. To this end an appropriation is made yearly and expended by agents appointed by the department of the interior for the purchase and importation of the best pure-blooded animals suitable for the purpose; the purchases are generally made from the Durham and Holland stock, and these animals are distributed among the different provinces and sold to the stock-breeders. The result is carefully watched and rewards are offered to those who are able to show the best specimens arising from judicious care and attention.

Professor Leyder, of the Royal Agricultural Institute, sends me a pamphlet written by himself upon the animals at the national exposition of 1880, and in his written reply to my inquiries he says:

> None of our races have sufficient merit to attract the attention of stock-breeders; also that our statistical documents are silent upon the subject of the distribution of cattle races among the different provinces.

In his pamphlet he states that the demands for home consumption, which the product is far from covering, call for large importations of cattle. Since a dozen years the excess of importations over exportations has been about 50,000 head yearly. Holland contributes most largely to this number, partly of cattle ready fattened for the market, of others coming to be fattened, and also of some reserved for breeding purposes. Of the 123,201, 121,138, and 142,480 head of cattle imported, respectively, in 1878, 1879, and 1880, there came from Holland 107,008, 106,933, and 113,808 head.

TRANSPORTATION OF CATTLE TO THE UNITED STATES.

Although Belgium has no cattle of her own to export for breeding purposes, she offers the best route of export from this part of the world to the United States. The White Cross line of steamers, sailing from Antwerp to New York, Boston, and Quebec, are fitted with the proper accommodations for the transport of cattle, and they carry a great many, principally coming from Holland, some from Switzerland, but more from Belgium. The cattle are brought to Antwerp by rail or water, are inspected by the veterinary surgeon, and then placed on board of the steamers.

COST OF TRANSPORTATION TO THE UNITED STATES.

The agents of the line here furnished me with the following as the rates of transportation, namely: £8 per head for cows, £7 per head for yearlings, £6 per head for calves, including installations, water, and feeding for twenty days. The men accompanying the cattle for attendance have free passage.

If no men accompany the cattle the steamer provides attendance at the rate of 4*s.* per head. If shippers provide feed the price is £2 less per head.

JOHN H. STEUART,
Consul.

UNITED STATES CONSULATE,
Antwerp, December 29, 1883.

BREEDS OF CATTLE IN BELGIUM.

REPORT BY CONSUL WILSON, OF BRUSSELS.

In a country where the subdivision of property is so great and the population so dense as in Belgium, the raising of stock and the improvement of breeds, of necessity, cannot constitute an important branch of agricultural industry; nevertheless, within the last few years there has been amongst agriculturists here a strong and persistent effort made to improve all animals that either furnish beef or dairy products for the people; as a result of this effort, it is doubtful whether there now can be found any purely indigenous breeds in this country. There are, however, several distinct varieties bred here, each generally confined to a particular district of the country, characterized by some peculiar quality of pasturage, soil, or climatic condition.

THE FURNES-AMBACHT BREED.

On the rich plains and poulders of East and West Flanders the prevailing type of cattle is that known as the "Furnes-Ambacht" breed, distinguished by handsome and well-proportioned forms, short legs, moderately large, crooked horns, and usually of a red and white piebald color. They are renowned for both the quantity and quality of their dairy products throughout the Kingdom.

THE ARDENNAISE BREED.

Farther east and west, on the slopes and valleys of the foot-hills of the Ardennes, where the soil chiefly consists of decomposed schist-quartz and affords a less abundant yet nutritious herbage, there has been bred, almost from time immemorial, another variety known as the "Ardennaise" stock.

This breed is characterized, when not crossed with any other, by its red color, small size, clean, smooth limbs, and long, sharp horns projecting forwards and surmounting a head carried well up, as though always on the alert against surprise or danger.

These animals are not usually good milkers, but produce rich and well-flavored meat, doubtless more or less resulting from the character of the herbage upon which they feed in this mountainous district.

THE CHARLEROI BREED.

In the Herve and Condroz districts, touching the German frontier on the northeast, there formerly existed a variety of cattle much resembling the Ardennaise, excepting that they were almost uniformly of a black and white piebald color; but within the last few years the introduction of the Shorthorns into these districts has greatly changed both their form and color, so that the pure Condroz race is now rapidly disappearing and the present stock of that region, known as the Charleroi breed, taking its place.

FOREIGN AND CROSS BREEDS IN BELGIUM.

These three varieties of cattle are all that can now, with any degree of propriety, be denominated native breeds, and of them and their crosses with the Shorthorn Durham, the Dutch Piebald, and a variety from Cassel, almost the entire herds of the country are the progeny.

Attracted by the rapid growth and splendid forms of the pure blood English Shorthorns, the farmers, in almost every district of this Kingdom, have attempted to cultivate them to the exclusion of their native stock, but with variable and by no means uniformly satisfactory results; for they overlooked the facts that the valley of the Tees, the true home of the Durham, abounds in rich pasturage and other cattle food to a degree greatly exceeding most of the cattle-growing districts of this country, and that the rapid growth and quick maturity of this stock demands a proportionate amount of special care and nutritious food.

Many of the stock-growers of this country, after having spent large sums of money themselves, and having received handsome subsidies from the Government in experimenting with these cattle, have been forced to abandon them and fall back upon crosses with their native stock, as more hardy in constitution and better adapted to the food produce and climatic conditions of their districts. The crosses with this stock, however, are now found in every district in the Kingdom, and have to a large degree supplanted even the famous Dutch breed so long and highly esteemed here.

I may add here that the importance given in this country to any one variety over the others above mentioned, chiefly depends upon the kind of pasturage and other food the department where they are found produces, in connection with its peculiar agricultural interest.

In the province of Antwerp the production of milk and butter and the raising of vegetables for the London and Antwerp markets are found so much more profitable than the growing of beef cattle, that the farmers of that district will have nothing to do with any but such cattle as produce the largest amount of milk upon the smallest amount of food, and for this they prefer the pure Dutch cow or her crosses with the Flemish animal.

In the province of Brabant great efforts have been made to introduce the pure blood Shorthorn Durham, and for awhile it was thought that this stock would drive out all others, but the increasing demand for milk and butter in Brussels and its populous environs, with the profitable market they afford the farmer for his root and vegetable crops of various kinds have here, also, arrested the introduction of Durhams and to a large degree substituted for them the small, hardy Hollands and their crosses, which, under a more moderate quantity of truck food, yield a larger amount of rich milk and butter.

In the province of Hainaut all efforts to introduce the pure Durham have failed to succeed. In a report of the agricultural commission of this province now before me the commission says: "It is impossible to believe that the prejudices for old habits and routine is the sole cause of this result; we are therefore forced to believe that this so perfect breed of cattle neither suits our exigencies nor our wants, and that we must content ourselves with a cross with the native stock instead of the pure Durham."

This, I have no doubt, is the opinion of all stock-raisers in this province, for, with the exception of a few fancy breeders, the farmers of the entire province cling to the pure native or its cross.

In the province of Liege a number of pure blood Shorthorn bulls and cows of a variety celebrated for its milk and butter producing qualities have been recently imported from England, with satisfactory results thus far, and it is thought that this variety of exotics may yet be found better adapted to this district, both as a profitable animal for the shambles and as a good milker, than any other breed; but this I very much doubt from the conflicting testimony I receive.

The farmers of Limbourg and Luxembourg are more devoted to the raising of beef cattle for the markets of the country than to milkers, and in these provinces the Durham crossed with the native stock gives entire satisfaction.

The province of Namur, from its topographical features and the character of its soil, is chiefly adapted to pasturage and to the raising of beef cattle for the market, but the pure Durham, though in repute amongst some of the farmers, requires a higher degree of nurture than the soil affords and is giving way to a cross with the Ardennaise stock.

CATTLE FEEDING IN BELGIUM.

Although, as before stated, Belgium is not to any considerable degree a cattle-raising country, the amount of care and labor the small farmers and dairymen bestow upon these animals is very great, and as a result they have succeeded, in many cases, in bringing their milch cows up to the highest degree of milk and butter producing qualities.

Many of these cows are stall-fed all the year; plenty of good water and the food best adapted to the production of rich milk is supplied them with great punctuality. They are combed and brushed and their skin kept perfectly clean; their stables are also models of cleanliness, and nothing is left undone either in the way of kind treatment, abundant food and water, or good shelter, to bring these animals up to the highest degree of perfection. Their food from May to October consists chiefly of an abundant supply of clover; from October to January turnips and carrots boiled are added to the fodder, and from January to May beets, and malt when it can be had, are fed. Clover and malt are here regarded as the best milk-producing articles of food.

YIELD OF MILK OF BELGIAN COWS.

From the most reliable information I can obtain a good, average fresh Flemish cow will yield from 28 to 30 liters of milk daily; a Flemish and Ardennaise cross, from 18 to 24, and a pure Holland about the same quantity. All the crosses with the Shorthorns may be set down as giving a fraction less than these figures in quantity; as a rule their milk is richer in cream and consequently in butter, but after the separation of the cream the milk is left proportionately poor.

MISCELLANEOUS STATISTICS.

The cows of all the native breeds and crosses in this country are considered at maturity when three years old, but bulls and steers, particularly of Durham crosses, will grow until they are four years old.

In the subjoined table, marked A, will be found, as nearly as I can ascertain it (in the absence of any statistics on the subject), the live weight of these animals at three years old, and the average price paid per kilogram, live weight, for them fattened for the market. The table marked B, giving their size, is a transcript of that published here on the occasion of the great national exhibition of 1880, and is the only reliable informaion I have been able to obtain on this subject.

IMPORTS OF CATTLE INTO BELGIUM.

As no census of the horned cattle in this Kingdom has been made since 1875, I am unable to give a reliable answer to the questions in your circular as to the present number, the percentage of breeds, and the proportion bred for the butcher and dairy; but official documents furnished me show that the importation of cattle into Belgium in 1881 amounted to 121,000 head, whilst the exports only amounted to 42,911 head, thus showing a deficit in the home supply for that year of 78,089 head.

Of the total number imported Holland supplied 91,080, and the United States 355 head.

PRICES OF BELGIAN CATTLE.

There were sold in the markets and fairs of the country in 1881, 186,262 milch cows, at a mean price of 300 francs per head; 74,065 heifers, at a mean price of 185 francs; of steers, there were sold 71,014, averaging, per head, 366 francs; and of young bulls, 33,431, at a mean price of 165 francs.

BELGIAN CATTLE FOR THE UNITED STATES.

It will be necessarily inferred from the prices paid for the animals of these various classes in the open markets of the country that they could not have been of a superior quality, and indeed this is the fact with regard to all horned cattle bred in this country. So far as my own personal observation has served me, I am convinced that the farmers of the United States have nothing to learn from this country in the matter of selective breeding and the production of valuable stock either for the shambles or the dairy, and I do not hesitate to say that more fine bovine specimens of pure and crossed bloods may be seen in a day amongst the farmers of our Middle and Northwestern States than can be found within the entire limits of this country.

As before stated the small farmers and dairymen have lavished a great amount of care upon their milch cows, and thus secure from them a large daily yield of milk; but I doubt not that on every well-managed farm or dairy in the United States there can be found cows that in this quality will equal the best of this country.

Finally, as a result of my personal observation and all the information I have obtained from other sources, I am convinced that no importation of milch cows from this country could greatly improve our present stock, and as to beef cattle, I have seen in the fields and stables of the farmers of the United States, both Durhams and Devons, not only far surpassing anything found in this country, but equal to the finest herds bred in England, their native home. If, however, notwithstanding these facts, any of our farmers feel inclined to test the improvement expatriation will produce on any of the stock of this country, I would recommend the Flemish cow as possessing qualities capable of a larger and more immediate improvement than any other of the native breeds, and now that there is a fine line of steamers plying between New York and Antwerp the experiment need not necessarily be an expensive one.

THE EXPORT OF AMERICAN BEEF AND BEEF CATTLE TO BELGIUM.

Whilst, however, I do not believe our stock growers can derive much benefit from the importation of Belgian cattle, I am convinced that, with proper management, an enterprise for the exportation to this country direct, of both live cattle, beef, and mutton would pay a large profit. In the herewith inclosed table, marked C, I have given the selling price of meat in the markets of the principal cities of this country, which will serve as a basis of calculations from which the profits of such an enterprise may be calculated, and I cannot but think that with the now regularly plying steamers between Antwerp, New York, and Philadelphia, a large and profitable trade of this character could be secured.

JNO. WILSON,
Consul.

UNITED STATES CONSULATE,
Brussels, November 9, 1883.

A.—*Average weight and price of three-year-old cattle in Belgium.*

Name of breeds.	Live weight.			Price per kilogram.		
	Cow.	Bull.	Ox.	Cow.	Bull.	Ox.
	Kilos.	*Kilos.*	*Kilos.*	*Francs.*	*Francs.*	*Francs.*
Flemish	550 to 600	600 to 700	600 to 800	0.88	0.95	1.05 to 1.15
Ardennaise	400 500	450 550	500 550	0.60	0.60	0.90 1.00
Dutch	500 600	550 650	600 700	1.00	0.90	1.00 1.10
Durham	550 650	650 750	600 800	1.00	0.90 to 0.95	1.00 1.10

Crosses with the Shorthorns have slightly increased the weight of all the native breeds above given, but, as will be seen, the Flemish ox commands the highest price per kilogram in the market.

B.—*Measurement of cattle exhibited at Brussels in* 1880, *and which received premiums.*

[In centimeters.]

Description.	Height.	Vertical depth of the breast.	Length of the head.	Height of hock.	Length of buttocks.	Length of whole body.
Bulls over three years:						
Native or crossed	144.2	81.7	58.5	55.5	62.7	188.7
Pure Durhams	145.2	84.0	58.3	53.6	62.0	181.7
Dutch	140.0	80.5	58.0	55.0	57.5	183.0
Ardennais or crossed	135.0	77.0	54.3	75.2	53.0	167.6
Bulls from one to three years:						
Native or crossed	138.0	78.0	55.0	45.0	58.0	179.0
Pure Durhams	141.0	78.3	55.6	54.3	62.0	178.0
Dutch	141.3	80.3	57.0	54.0	60.7	179.7
Ardennais or crossed	124.7	69.0	50.7	53.0	45.0	150.0
Cows:						
Native or crossed	141.5	77.0	56.0	54.5	59.2	180.5
Pure Durhams	138.0	78.3	52.1	53.1	59.7	172.7
Dutch	139.0	77.3	56.3	53.0	56.0	169.3
Ardennais or crossed	129.7	71.3	50.3	52.3	53.3	163.0
Heifers from two to three years:						
Native or crossed	134.4	72.3	50.6	54.0	54.3	165.0
Pure Durhams	130.3	74.8	49.0	49.3	53.3	163.3
Dutch	135.3	72.0	50.3	51.6	51.7	164.7
Ardennais or crossed	130.7	67.0	49.0	51.3	49.0	161.0

C.—*Average price per kilogram of the whole carcass of animals killed and dressed for the markets in the principal cities of Belgium.*

[In francs.]

	Ox.	Bulls.	Cows.	Veal.	Mutton.
Antwerp	1.62	1.39	1.49	2.00	1.82
Brussels	1.65	1.42	1.50	2.05	1.60
Bruges	1.80	1.40	1.70	2.00	2.00
Ghent	1.66	1.38	1.50	2.14	2.91
Mons	1.85	1.50	1.75	1.90	1.75
Liege	1.60	1.34	1.50	1.45	1.55
Hasselt	1.70	1.50	1.60	1.80	1.90
Arlon	1.60	1.30	1.60	1.20	1.80
Namur	1.82	1.59	1.70	1.77	1.81

CATTLE AND CATTLE BREEDING IN BELGIUM.

REPORT BY CONSUL TANNER, OF LIEGE.

DIFFICULTIES IN THE WAY OF SECURING CATTLE STATISTICS.

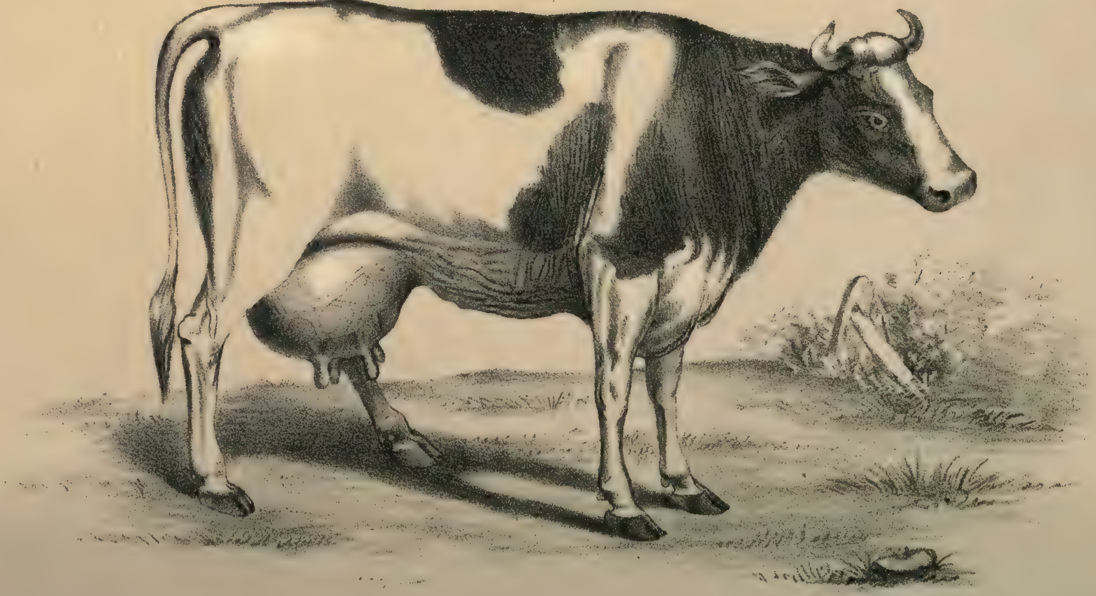
I can appreciate the desire on the part of the Department to make an effort to elevate the standard of American cattle; and it would afford me pleasure of no ordinary degree should it be in my power to aid in this important matter. The inquiries contained in the cattle circular are far-reaching and very comprehensive. In a small country like Belgium, where at least three distinct languages are spoken, where weights and measures are so different from our own, one encounters difficulties (in ascertaining facts such as are sought for by the circular) of such a nature and from so many different quarters as to almost discourage one in pursuit of them from all efforts. Most farmers in this part of Belgium speak Valoonish, those near Antwerp or in the western part of Belgium speak Flemish, while the better classes speak French. The laboring classes not only cling tenaciously to their ancient language, but they manifest absolutely no interest in imitating what is called the higher class in speaking French. The consequence of this is that, as they must come in contact with the laboring classes, and as all the servants are from the Valoon class, the mountain must go to Mohammed, the better classes must know enough Valoon to speak and understand it. This being the case, I hope the efforts of the Department in a field so difficult to get at facts will be appreciated by our stock-raisers.

BELGIAN CATTLE BREEDS.

So far as the different breeds of cattle in Belgium are concerned they are as numerous as there are localities of different names, and there has not been that general and universal effort to retain purity of breed in Belgium, such as has been the case in England. There has been effort, however, to this end in a few cases of families of rank, who have been very particular about the pedigrees of their cattle, and therefore in this way there are several breeds that have retained their untarnished pedigrees most faithfully. The breeds to which I allude present now, in outward appearance and in results for both the dairy and for beef, cattle that cannot be surpassed in the world. This is more particularly true of the breeds known here as the Hollandais or Dutch cow and the Flamande or Belgian cow. There is a strong likeness between these two breeds that suggests unmistakably to a judge of cattle a common origin. Of this there is not a question in my mind. I will not take space to explain why I am so thoroughly convinced of this.

ASSUMED ORIGIN OF THE ENGLISH SHORTHORNS.

Professor Hengeveld, a Dutch authority of great repute on cattle, says that the Shorthorns of England had their origin from the cattle of North Holland in this way: "When William, Prince of Orange, was called to the British throne, he missed greatly the fine flavor and rich, creamy milk of his native land, and had a shipload of them imported from Holland to England, and from these sprang some of the now most famous breeds of cattle in England." If that is true, I am glad to call the attention of the Department to it, as it seems to answer one of the



Julius Bien & Co Lith.

A BELGIAN COW – DUTCH BREED

inquiries of the cattle circular, as to whether the breed of cattle are improved by migration ? as the Shorthorns which sprang from the Hollandais seem to thrive better in England, and seem to be greater favorites than any other breed of cattle in the world.

CATTLE CENSUS OF BELGIUM.

Statement showing the different breeds and number of cattle of different breeds in Belgium.

Name of breed.	Price per head (average), cow.		Height.	Depth of chest.	Length of body.	Circumference of body.	Length of neck.	Width across hips.	Average weight, cows.	Number of breed in Belgium.
			Ft.	*Ins.*	*Ft.*	*Ft.*	*Ins.*	*Ins.*	*Lbs.*	
Hollandais, Dutch, or Holensteins	$118 to $180		$4\frac{3}{4}$	32.2	6^{1}	$7\frac{3}{4}$	25	$32\frac{1}{4}$	2,204	169,000
Flamand or Belgian, three types:										
Boulonnais	195	$252\frac{1}{2}$	$4\frac{3}{4}$	33.3	$5\frac{6\frac{1}{2}}{12}$	$7\frac{3}{20}$	24	26.9	1,999	210,000
Bourbonne	118	$148\frac{1}{2}$	$4\frac{5}{8}$	34	$6\frac{1}{4}$	$7\frac{3}{20}$	24	$30\frac{1}{2}$	1,676	
Picardy	118	$148\frac{1}{2}$	$4\frac{5}{8}$	34	$6\frac{1}{6}$	$7\frac{3}{20}$	24	$30\frac{1}{2}$	1,676	
Danois	110	135	$4\frac{3}{4}$	30	$5\frac{2}{3}$	$7\frac{1}{3}$	23	25	1,659	80,000
Flechet	60	100	$4\frac{1}{8}$	27.3	$4\frac{2\frac{3}{20}}{12}$	$7\frac{1}{6}$	22	$23\frac{1}{2}$	1,290	10,000
Charleroi	60	90	$4\frac{7}{12}$	30.3	$5\frac{7}{12}$	$7\frac{7}{12}$	23	$22\frac{1}{2}$	1,713	80,000
Contentine (Norman)	60	90	$4\frac{7}{12}$	30.3	$5\frac{7}{12}$	$7\frac{7}{12}$	23	$22\frac{1}{2}$	1,740	50,000
L'Oldenbourg	55	70	$4\frac{3}{4}$	33.3	$5\frac{5}{6}$	$7\frac{3}{20}$	23	25.9	1,735	122,000
Durham	65	85	$4\frac{3}{4}$	32.2	$6\frac{1}{6}$	$6\frac{5}{6}$	24	$31\frac{1}{4}$	1,800	50,000
Ayreshire	65	80	$4\frac{1}{6}$	30.2	$5\frac{1}{12}$	$6\frac{3}{4}$	21	25	1,300	15,000
Jerseys	60	75	$4\frac{1}{12}$	28.1	$4\frac{1}{6}$	$6\frac{3}{4}$	22	22.9	1,200	10,000
All others										850,000
Total cattle in Belgium										1,556,000

THE FAVORITE BREEDS IN BELGIUM.

As before stated, there has not been that general effort in Belgium to retain purity of particular breeds which has been the rule in England. There are many distinctive breeds here, but this is more in consequence of the customs of the people, who care little for change. More effort has been bestowed on the perfection of the material on hand than in trying to accomplish such results from foreign stock. Each breed has its advocates as to its superiority, and if an equal assemblage of the representatives of all the breeds should meet to determine which was the best, it would be difficult to arrive at a decision. I believe, on the whole, that the contest would be reduced to three breeds, viz, the Flemish, the Dutch, and the Flechet. Between these three the contest would be very close, with many advantages in favor of the latter, the principal being the richness of the milk and the cheapness of the cattle.

THE HOLLANDAIS.

The Hollandais, or Dutch, cattle, on the whole, I think are generally more esteemed than any other, though the Flemish, which belong to the same family, hold almost equal rank. The two cuts below will represent, though in an unsatisfactory manner, the Holland cow as she exists in this section.

The color is black and white, but it often varies, as it does also in the Flemish, to a brindle-reddish or dun color, varied with spots of white.

THE FLEMISH COW.

The cut below will represent the Flemish cow with tolerable accuracy.

This breed of cows ranks almost equally with the Dutch, even in North Holland, and, in France, Germany, and Switzerland, are esteemed above any English breeds by all those who know cattle. That which this breed lacks in quantity of milk it makes up in quality, and that which it lacks in size for beef is compensated in the same way. These two breeds are as gentle and kind in disposition as it is possible for cattle to be. A child can walk up to them anywhere or at any time, and lead them or play around them, without any fear of harm.

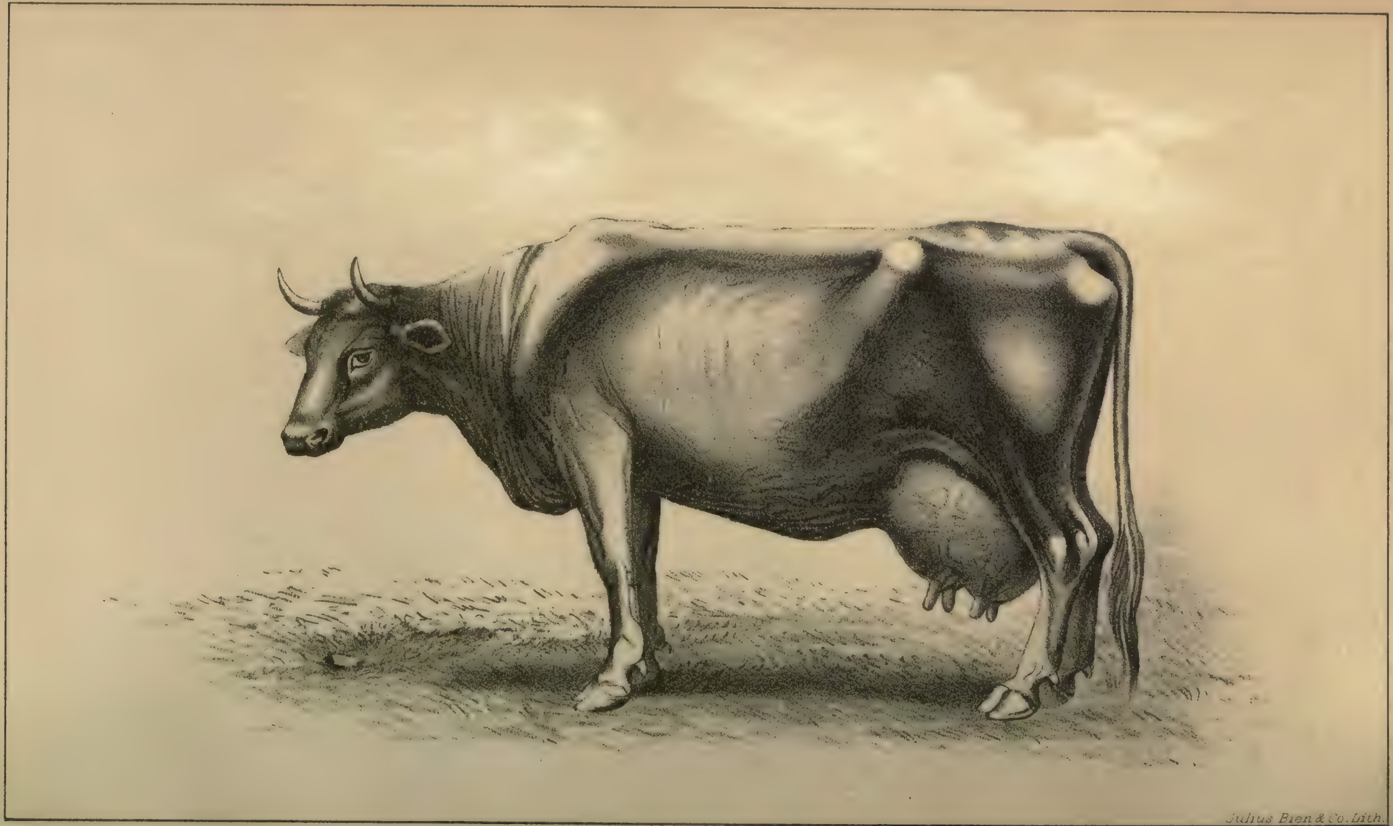
THE FLECHET BREED.

The Flechet breed is a very remarkable breed of cattle. They are small, as will be seen by the table, and of a red and white color. The products of this breed are better known here than the breed itself. *Le beurre de Herve* (butter from Herve) brings in this market from 15 to 20 cents more per kilogram than that of any other butter, and milk and cheese from this breed of cattle are equally valuable. I am told that the King of the Belgians sends all the way from Brussels and draws his supply of butter and cheese from the dairymen of Herve. The home demand for the butter and cheese of Herve is greater than the supply at 15 to 20 and even 25 per cent. more per pound than any other cheese or butter, but for all this it finds its way through intermediaries into Brussels, Paris, Amsterdam, Berlin, Cologne, and Aix la Chapelle for the best restaurants and hotels. This breed of cattle shows perhaps more than any illustration that I could point to that the theory advocated by me in this dispatch is a good and rational one, and causes me to advocate it with the more confidence.

The farmers of Herve know absolutely nothing about the genealogy of this breed. They only know that the same cattle have grazed on the same pasture during the life of their fathers, or grandfathers, and that they yield good, rich milk, and that they must take good care of them. If you were to talk to them about pedigree you would not be understood; they have none—only that they are good cattle. They are not even known by name, and I have therefore taken it upon myself to name them after Chevalier F. Flechet, the well-known authority on agriculture, who has done and written so much and so ably for the agricultural interest of his section. Through the urbanity of Mr. Flechet I am enabled to send the photographs of this breed. I would take this occasion to offer a word of warning to Americans who may read that which I have said of this breed of cattle, and who may be desirous of possessing them, and that is, to profit here by their English experience, and if they buy do so quietly, so that the price will not be run up on them here as it has been by the shrewd cockney.

IMPORTS OF BUTTER INTO BELGIUM.

The percentage of cattle bred for the dairy in Belgium would reach 20 per cent. The remainder would go to the butcher and for breeding and draft purposes. Artificial butter is extensively used and manufactured in Belgium and is imported from Holland as well as the genuine article. The total importation of butter into this little kingdom amounted to nearly 9,000,000 kilograms for 1881, being, however, more



Julius Bien & Co. Lith.

FLEMISH COW

by nearly 1,000,000 kilograms than for 1882 and most probably the same for the present year. The imports of butter into Belgium for 1882 was 7,842,000 kilograms, valued at 28,501,648 francs, the bulk of which went to Holland and France; to the former 13,697,299 francs, and to the latter 8,528,234.

IMPORTS OF MEAT AND MEAT CATTLE INTO BELGIUM.

The quantity of cattle or meat imported into Belgium for home consumption is hard to arrive at. The tables transmitted with the present for translation by the Department will be as near as can be ascertained. A vast amount of the imports of beef and cattle are merely in transit to some other country. The consumption of meat in Belgium is not so great as in England, because of the better compensation received by the English laborer, which enables him to supply his table more liberally. Few workmen in Belgium are there that taste meat (other than pork and horse flesh) more than once a year. Even the better classes do not consume beef in proportion to the same classes in the United States and England. During Lent and on Fridays Catholics do not eat meat, and, with five millions of people, that would make a vast difference in the annual consumption of an article. But for all this Belgium does not produce nearly one-half enough meat for home consumption. The tables inclosed will show the Department from what countries Belgium makes up her deficiency. That the United States takes such an insignificant part in the profits of this business is deplorable, and can come from nothing but lack of effort on our part. Every business man knows what is wanted to introduce and extend his business at home, and from that he must surely be able to draw conclusions as to what he must do to extend it beyond our borders. It would seem almost folly to repeat a thing so simple, viz: It is only to supply a good article cheaper than any one else can supply it and make it known to dealers in such articles abroad by samples or otherwise. Cheapness is the thing that goes further than anything else, and it is hard to hide a cheap article even if we want to hide it, and therefore it is very easy to make it known.

COUNTERFEITING AMERICAN PRODUCTS.

There are prejudices here now against our products which Americans at home can destroy by continuing to prove that they supply good and pure articles. They can in this way show to the people here that great rulers and their ministers can descend to misrepresentation for a purpose. I called personally on every important dealer here in American supplies and asked him to apprize me if at any time there should be any complaint against any American article that might pass through his hands. Only a few days elapsed before one sent me a note saying that he would like to have me call. I did so without loss of time. He said that there had been complaint about some American butter that the inspector had examined and pronounced it *mauvais* and *artificial*. I asked him if he had received the butter direct from the United States. "No," he said, "it came from a house I trade with in Mastricht." On looking at the firkin that contained the butter it had the name of a house in Newark, N. J., but I could see at a glance that the printing on the label had not been done in the United States. I summoned the inspector and insisted that the label be torn off, which was reluctantly done. Underneath the label was the Dutch brand that had been burned into the wood of the firkin, showing that it came from Mastricht. The fraud was revealed at once, and I was relieved at once, because I knew that good butter is very difficult to keep fresh for any length of time, and that if the butter had been of American origin that the chances were that it was either artificial or that it was rancid. I mention this matter only to show the Department to what an extent we must fight against the unfair methods that are resorted to in order to create a prejudice against us. I am determined that these prejudices shall have no foundation in this consular district. If any American should, on the other hand, contribute towards these prejudices by importing an article that would have that tendency, I want to expose him at home.

AMERICAN PRODUCTS FOR BELGIAN CONSUMPTION.

We can supply meats, butter, eggs, poultry, &c., to the markets of Antwerp and Brussels cheaper than it can be supplied from France or Holland by 3 or 4 per cent. on the pound. I mention these two places because Antwerp is the entrepot for Belgium, and places in the interior generally supply themselves with foreign commodities from there, and hence it is to this place that the principal efforts for the introduction of American articles must be directed. It would be well to extend those efforts to Brussels, as a large surrounding area draws its deficiency in provisions from that city, and many merchants doubtless go there that do not go to Antwerp.

PRESERVATION OF MEATS AND VEGETABLES FRESH.

Dr. Clossett of this city has invented a means of preserving the freshness of meats and other provisions which may be of great service to our exporters in these articles. I have asked him for a statement of the merits of his process, which I herewith inclose. He has secured patents for this process both in Europe and America.*

GEO. C. TANNER,
Consul.

UNITED STATES CONSULATE,
Verviers and Liege, October 13, 1883.

BELGIAN AND DUTCH MILCH COWS.

REPORT BY CONSUL WILSON.†

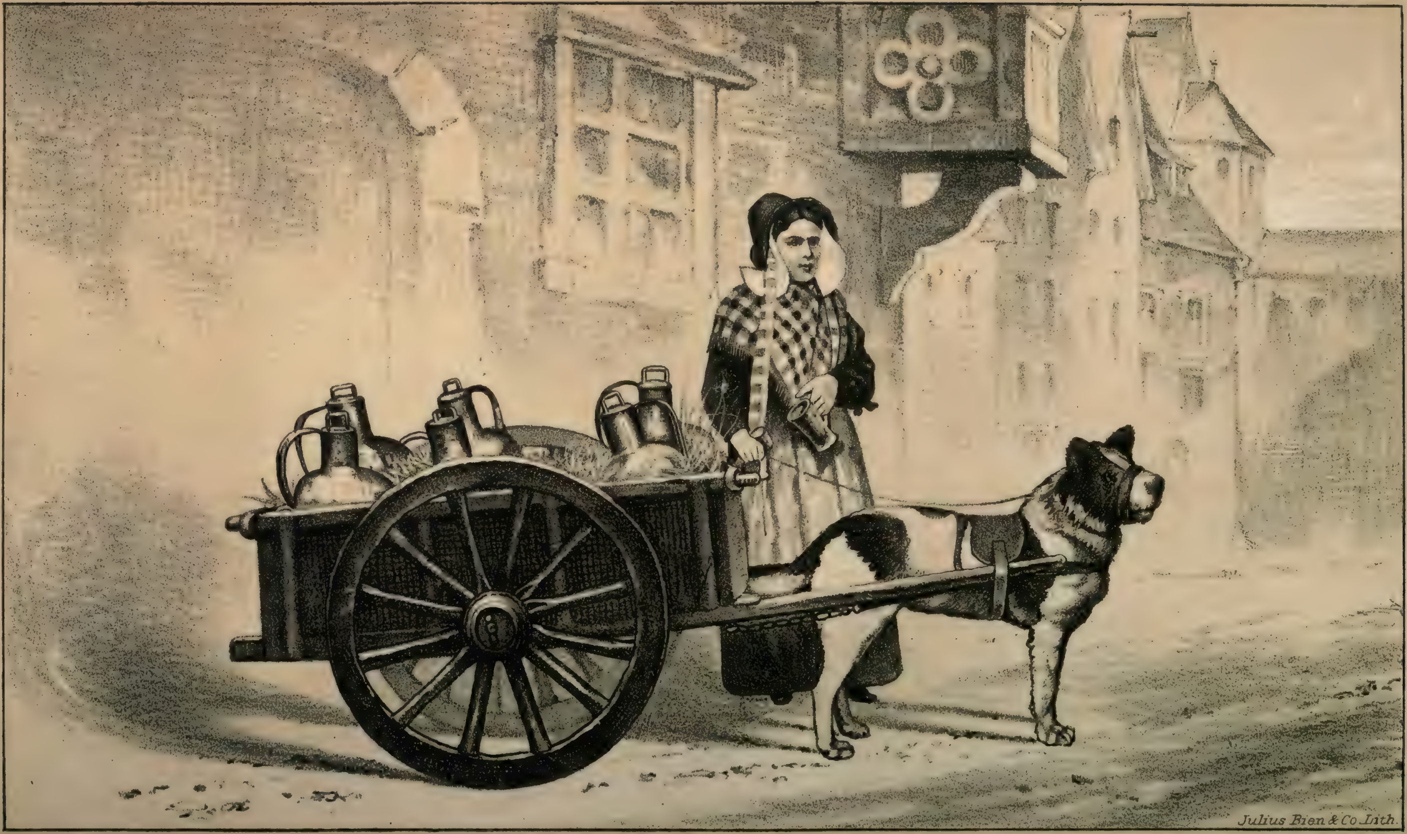
Referring to my dispatch No. 17, September 15, and the fêtes given during the past summer upon the occasion of the semi-centennial anniversary of Belgian independence, wherein I described somewhat the commercial maritime history of Ghent, and the installation of the new basin and docks, I continue the subject by some descriptive comments

---

*The statement here referred to, concerning the preservation of fresh meat, and a valuable paper on farming in Belgium, also transmitted by Consul Tanner, will be found in the supplement.

†Consul Wilson, writing from Nantes, under date of December 17, 1883, represents that no material of any account on which to base a cattle report exists in that district, and refers to his report on the dairy exhibition at Ghent in 1881, which, being most apropos to this work on the cattle breeds of the world, is herewith republished from Consular Report No. 15. Some valuable tabulated statements, together with appropriate illustrations, not published before, are inserted in the report in its republished form.

PLATE 161


Julius Bien & Co. Lith.

DELIVERING MILK IN BELGIUM

on the fête of the agricultural society of the province of Flandre Orientale held in this city, and which took the form of an exhibition of the milk industry of Belgium and Holland. It consisted of three grand divisions:

1. Milch cows, the producers.
2. Milk, butter, and cheese, the products.
3. The machinery and mechanical appliances used. These will be treated in inverse order.

DAIRY MACHINERY.

The machinery was interesting and accomplished its work well, but requires no elaborate mention, for the "universal Yankee nation" can be taught but little about machinery upon which is brought to bear, every day in the year, the inventive genius of every farm-yard, cheese factory, and creamery in the land.

One machine is worthy of description. It was the invention of Lefeldt, of Paris, for separating rapidly the milk and cream. It is a well-known fact that milk is heavier than cream. The usual method is by the application of the law of *gravitation* to this fact. The invention consists in the application of the law of *centrifugal motion*. The fresh milk is put in what resembles a common upright cylindrical milk can. The can is made to revolve, still upright, at a high speed. The milk, being the heaviest, flies to the periphery, which forces the cream to the center. They are thus separated instantly, and are drained off by means of flexible tubes—into one vessel the milk, into another the cream. The only care apparently necessary is to keep up the speed, and to properly gauge the quantity at the entry and exit.

Among the machinery exhibited was some for agriculture, and I was surprised to see the United States so well represented. Of lawn-mowers from Philadelphia, pumps from Seneca Falls, rakes, hoes, hay and dung forks, both from New York and Philadelphia, the United States had nearly a monopoly; and the importer, Dutry-Calson, said, for lightness, combined with strength and beauty of style, no other implements could successfully compete with ours. He said England, Germany, and Belgium could make them as *good*, but they were clumsier and heavier.

Here was another illustration, if one be needed, of the necessity for industrial art education among our mechanics. With an improvement approaching thoroughness in knowledge of the principles of art as applied to industry, the American mechanic can lead the world in the manufacture of articles for every day use, whether of necessity or luxury, and a demand will be created *for them*, which will be coextensive with the knowledge *of them*. This should be the ambition of every American mechanic, and when done, it will justly be the pride of the nation which gave him birth.

There were many sample wagons and carts for the delivery of milk to the customers, showing neat contrivances to insure its safety from adulteration by the carrier, but these have not yet come into general use. The commonest method of delivery in this country is shown by the following photograph, taken from nature.

BELGIAN MILCH COWS.

The second division, milk, butter, and cheese, will be reserved for another dispatch, if deemed of sufficient importance.

The first division, milch cows, would have been of great interest to American breeders and stock-raisers. I believe this subject can be studied with advantage and benefit to the people of both countries, and it is for this reason I deem it my duty to make this report.

An object to be desired by the cattle-breeders of the United States is an increase in the *size* of their beef cattle. This, I believe, can be materially aided by the importation of the large cows of the Holland and Flemish races and cross-breeding them with the cattle of the United States. I also believe this will be accompanied by an improvement in the milking qualities.

The outlay in time, trouble, expense, money invested, &c., is just about as much to raise a poor or small steer as a large one, while the recompense is increased as the weight increases. It needs neither illustration nor argument to prove the benefit.

The only question is its feasibility with sufficient benefit to compensate for outlay.

If the cattle-breeders of the United States could have seen the herd of cows at this exposition, as I did, they would have been impressed, as I was, by the great size of the cows and the desire to use them in the manner suggested.

There were 372 cattle entered for exhibition, nearly every one being milch cows, for the exhibition related exclusively to the milk industry.

The races represented were the Dutch or Holland cattle, the Belgian or Flemish cattle—both of pure blood—and some Durhams crossed with these. The first two are indigenous to their respective countries, very much alike, and doubtless sprang from the same stock. I am not sufficiently expert to give an opinion, but I believe them to be the same, or nearly the same, breed known in the United States as Holstein cattle.

Although these cattle may have no standing in the English and American herd-books as blooded cattle, I am constrained to believe it is rather a fault to be charged against the books than against the cattle, for it can be demonstrated that they have an ancestry many centuries old, from which, and through which, they have had a pure and unbroken descent, breeding in and in, without admixture or deterioration, preserving and perpetuating the characteristics and distinguishing marks of their race with a great certainty, definiteness, and exclusiveness as the best blood known. Motley speaks of them as noted nearly three hundred years ago for their size and general good qualities.

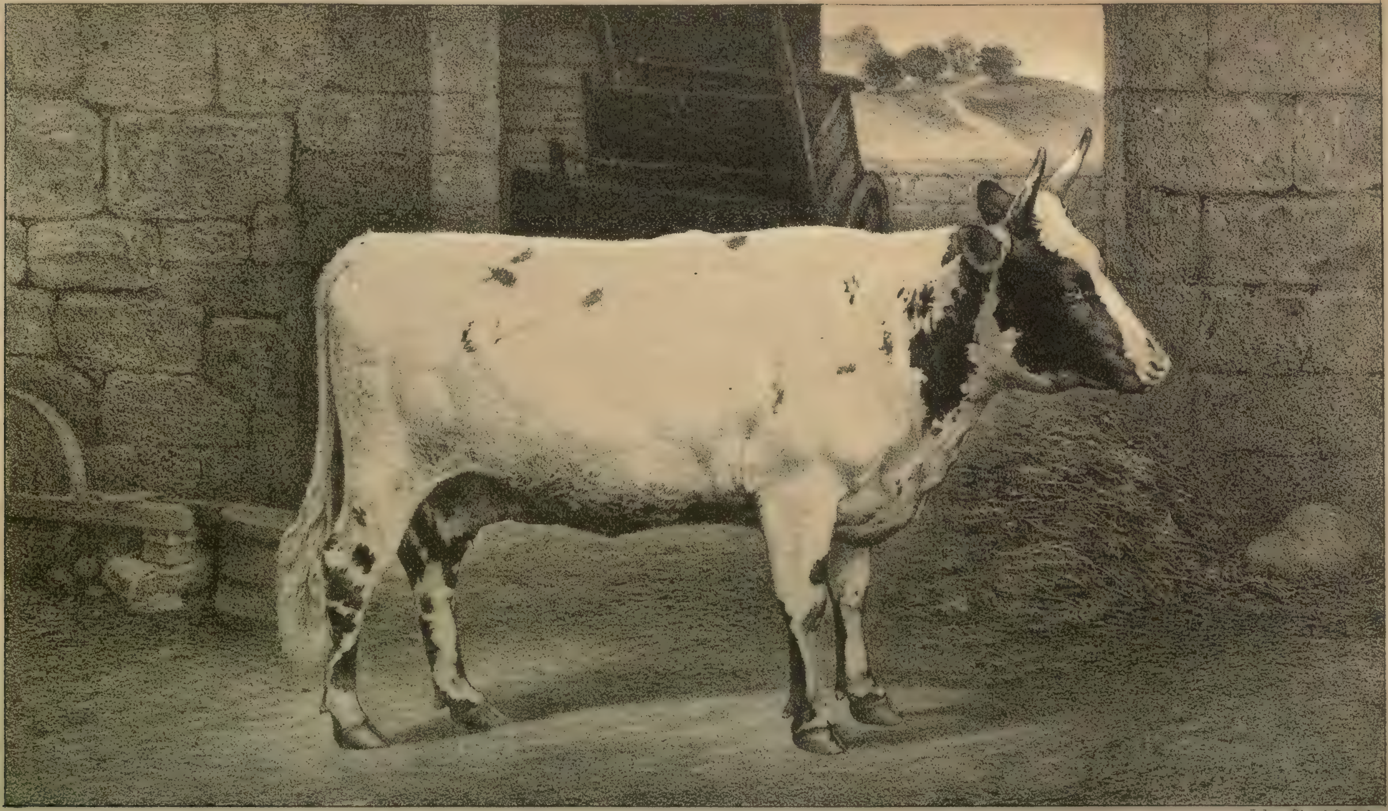
The agricultural society of the Netherlands has within a few years published a herd-book containing the pedigree of their cattle as far back as it can be traced. Their examination shows the existence of this, as a distinctive breed of cattle, in possession of this country as far back as the thirteenth century.

The color of the Belgian cattle is most frequently black and white, while the Hollanders are the same, but sometimes with a sprinkling of corn or tan color, something like that of the Alderneys. Sometimes this gets to be almost red, like the Durhams. But in both the dominant colors are black and white placed in large spots over the body; so also are the other colors, though smaller and sometimes running off into flecks. Their colors are somewhat known by the celebrated paintings of Paul Potter, of Amsterdam, made in the seventeenth century.

A tolerably correct idea can be obtained of a Holland or Belgian cow from the accompanying photograph; not taken for, nor presented as an entirely correct representation, but the nearest I could easily procure.

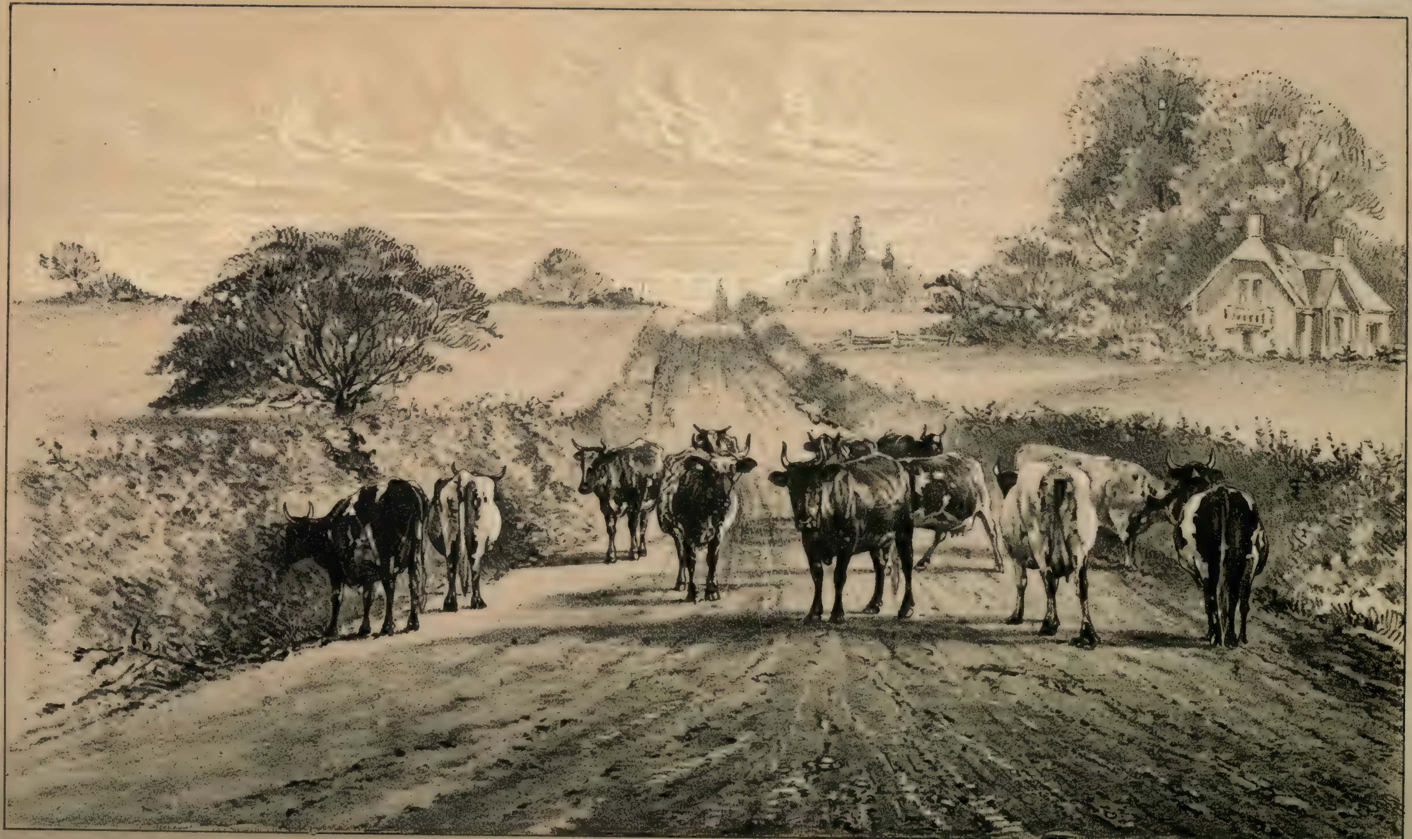
The landscape illustration herewith gives a better idea of these cattle; and when the traveler by rail or canal looking down, as he does,

PLATE 162



Julius Bien & Co. Lith.

BELGIAN COW



Julius Bien & Co. Lith.

BELGIAN MILCH COWS

on the low level lands of these countries, beholds a landscape, broad and deep, of rich green meadow, set in a frame of distant timber, each field bounded by one, sometimes two, rows of tall sentinel trees which look like a skirmish line, farm houses and barns with red-tile roofs, windmills throwing their giant arms about, apparently proud of their strength, while dotted over the grass, lighting up the scene with their large black and white spots, as something to attract and rest the eye, are to be seen, some standing, some browsing, some lying down, all quietly chewing their cud, a thousand of these cattle, immense in their size, with their sleek smooth coats, he says, "This is a land of richness; here are the evidences of prosperity."

SIZE AND WEIGHT OF BELGIAN CATTLE.

I give in tabular form the size of these cattle, and I ask any breeder or farmer to compare these sizes by measurement with his own cattle, and see if my conclusions are not correct.

Description.	Height.	Depth of chest.	Length of body.	Circumference of body.	Length of neck.	Width across hips.	Average weight.	Average price.
	Ft. In.	*Ins.*	*Ft. In.*	*Ft. In.*	*Ins.*	*Ins.*	*Lbs.*	
Flemish or Belgian bulls	4 8¾	32.2	6 2	7 8.5	24.8	23.2	2,200	$120 to $140
Flemish or Belgian cows	4 7½	33.3	5 10.9	7 1.8	23.2	34.8	1,650	200 240
Holland three-year-old bulls	4 7¼	31.5	6 0.8	7 4.5	22.8	23.6	1,875	100 120
Holland three-year-old cows	4 6¾	30.3	5 6.5	6 10.2	22	23.2	1,450	160 200

It must not be understood that these figures represent the size, weight, or price of all Belgian or Holland cattle as they might stand in a herd; neither do they represent the exceptionally large ones. They are obtained by taking the average of the prime first-class cattle as they have been exhibited at the various exhibitions in Belgium.

The following table represents another class of cattle, those for beef or milk, not the finest, choicest cattle, such as are described in the foregoing table, but such first-class, prime cattle as can be bought in market every day, giving the average for each item. It gives the weights, both alive and dressed, the prices per pound for each, the percentage of clean beef after slaughtering, and the price of each animal:

Description.	Weight, alive.	Weight, dressed.	Percentage after slaughtering.	Price per pound, alive.	Price per pound, dressed.	Price per animal.
Beef, three years and over:	*Pounds.*	*Pounds.*		*Cents.*	*Cents.*	
Oxen	1,325 to 1,540	750 to 1,000	56 to 60 60 to 65	8½ to 9 9 to 10	14 to 15	$125 to $150
Cows	1,200 to 1,450	600 to 825	53 to 57	8 to 9	15	80 120
Cows for milk	1,200 to 1,450					80 120
Heifers, two to three years	1,100 to 1,250					60 80
Yearlings						30 40 50 60

MILKING QUALITIES OF BELGIAN COWS.

I might content myself with giving results, but many farmers and dairymen would desire the formula, may be for their satisfaction, may be for their use.

The cows were divided, by numbers, into groups, and one or more members of the jury assigned to each group, so as to give his personal attendance and supervision, whenever anything was to be done.

The exhibition lasted four days. At six o'clock of the evening of the third day, at a given signal, each cow was milked clean and dry, preparatory to the test of the morrow.

The hours for milking were first fixed for 6 o'clock a. m., 12 m., and 6 p. m., but some complaints were made that the cows would not be able to hold their milk for twelve hours, and the first milking was advanced to 4 o'clock a. m. Every owner provided his own milkers, with whom his cows were acquainted.

The milk being taken from the cows was weighed, not measured, this being considered more accurate—each one separate, of course—and after being thoroughly stirred, samples were taken for tests of cream and for specific gravity, and the rest returned to the owner for his use.

The samples for cream were then examined, each one being made the same quantity and height in the glass, and being immersed to the neck in a large pan of ice-cold water, were set aside for the cream to rise. All samples were subjected to exactly the same treatment under the same conditions.

Many methods and machines, scientific and otherwise, for determining the quantity of cream were considered, but none were believed to be so fair and equal as this.

Such was the treatment after each milking, and at every step an accurate record was made by the member of the jury in charge.

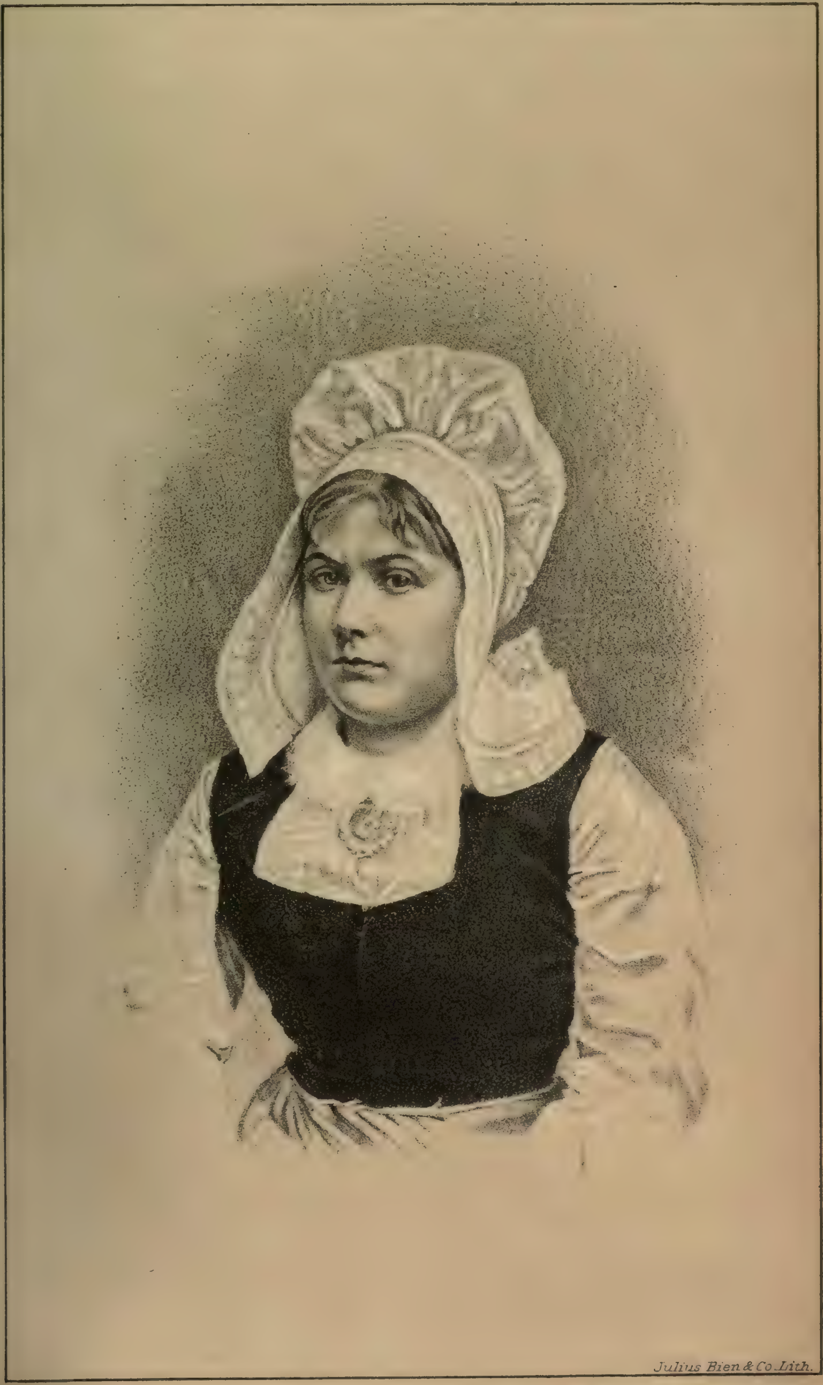
The specific gravity was taken at 15° centigrade, 58½° Fahrenheit. The samples for cream were allowed to remain until the next morning at 9 o'clock; so the duration of their stay was twenty-six, eighteen, and twelve hours, respectively. The water in the pan then marked 12 C., 53 F.

The samples being taken out, the height of the cream was accurately measured and weighed, and all recorded on blank forms prepared for the purpose. The result will be given further on. (See Table No. 3.)

Butter is the principal product from within this province, and therefore the interesting question was, which cow's milk would have the most cream and consequently be the richest in its butter-making qualities.

The amount of milk and of cream given by each cow for one day being determined, that would determine the relative value of the cows in these regards *on that day.* But these cows may have been giving milk for different periods; one cow calved one month, and another six months previous; then the conditions will have been so changed that the amount of milk or cream given on that day is no true test. And this change of condition is inevitable unless all the cows could be induced to calve on the same day. As this could not probably be done, and would not be desired if it could, some arrangement must be made by which this difference can be equalized.

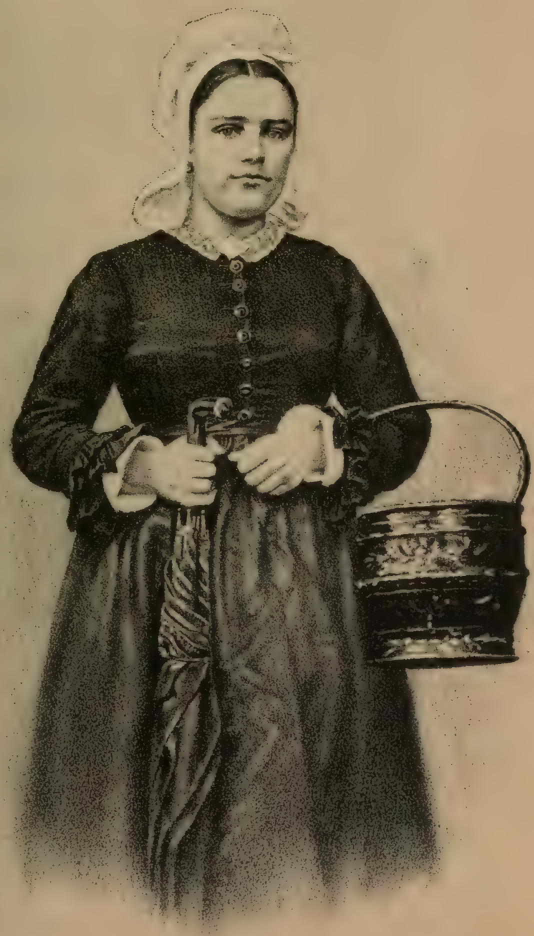
This was done by the adoption of a table of experiments and tests, made and prepared during the past two years by Mr. Tisdall, of the Holland Park and Horton dairy farms in England, at the request of the Dairy Association of Great Britain, and used at its great exhibition in 1880. (Agricultural Gazette, February 21, 1881. Table No. 1.)



Julius Bien & Co. Lith.

A FLEMISH MILKMAID

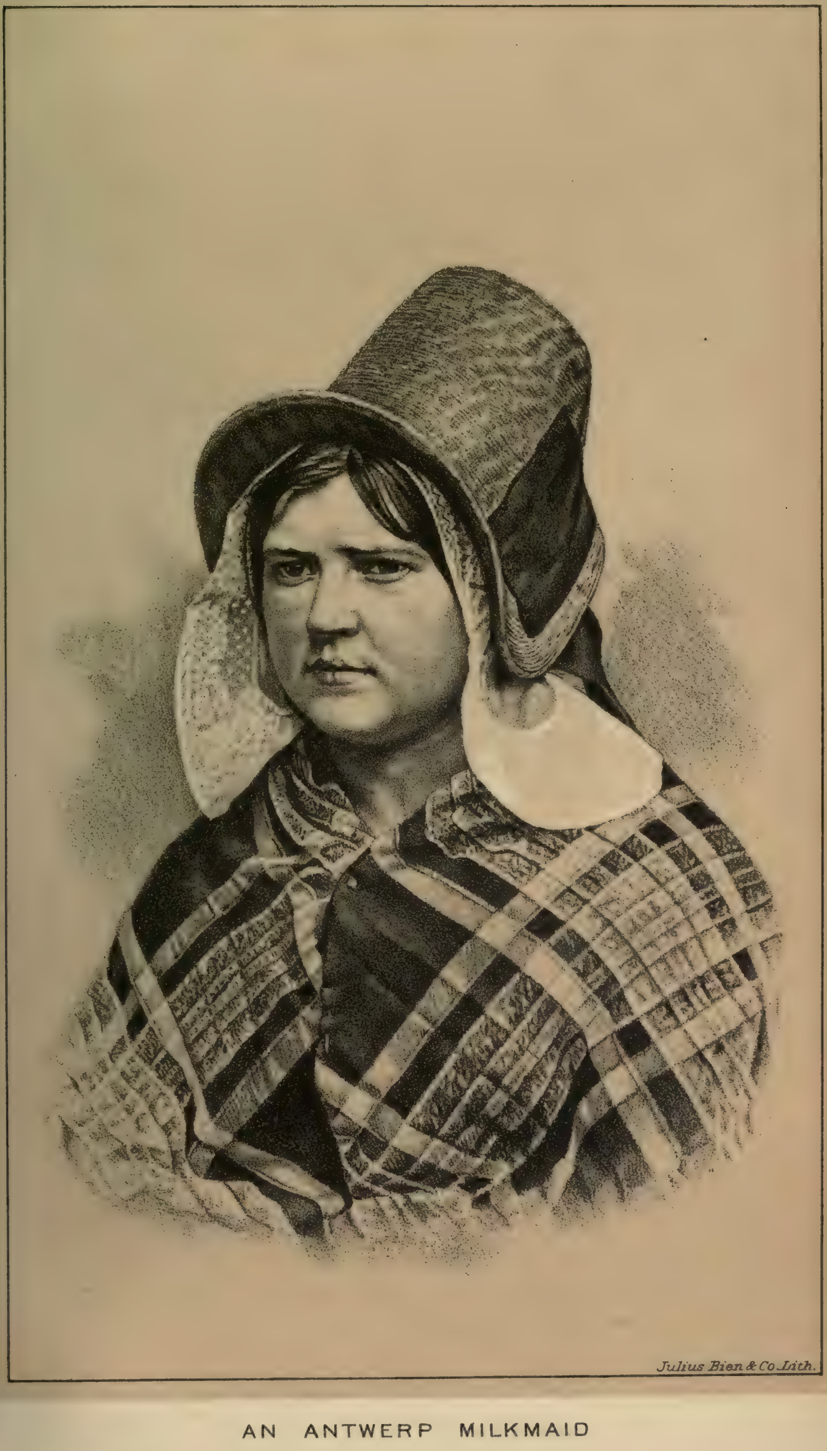
PLATE 165



Julius Bien & Co. Lith.

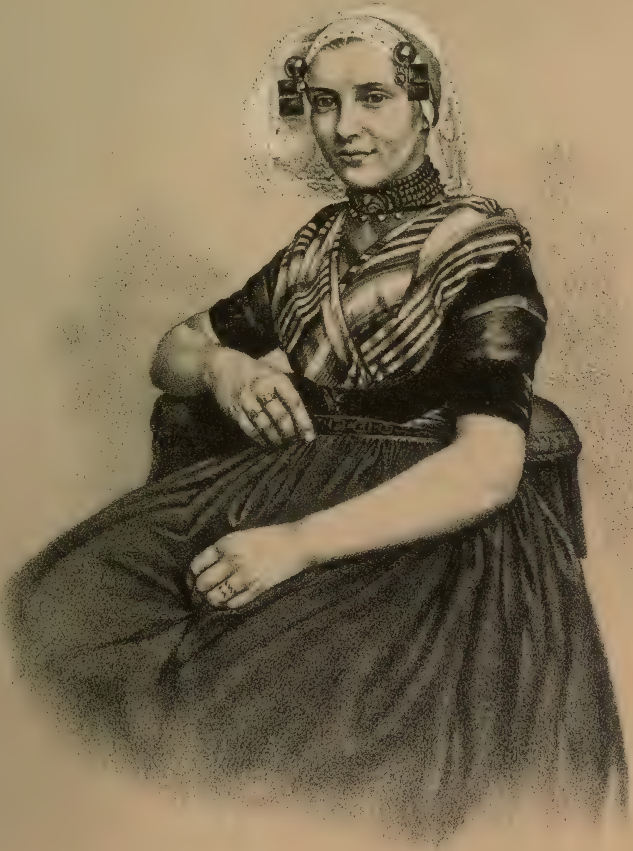
A BRABANT MILKMAID

PLATE 166



Julius Bien & Co. Lith.

AN ANTWERP MILKMAID



Julius Bien & Co. Lith.

A DUTCH MILKMAID

TABLE No. 1.—*Milk given by sixty English cows during twelve months.*

[In quarts.]

Number.	Names of cows.	First month.	Second month.	Third month.	Fourth month.	Fifth month.	Sixth month.	Seventh month.	Eighth month.	Ninth month.	Tenth month.	Eleventh month.	Twelfth month.	Average for the twelve months.	Number of milk months.
1	Victoria (second prize, dairy show, 1878).	18.5	14.5	11.0	11.0	9.5	8.0	7.5	7.0	6.0	5.5	5.0	2.5	8.83	12
2	Primrose	18.5	19.0	17.0	13.0	11.5	11.5	9.5	8.5	8.5	8.5	6.0	7.0	11.54	12
3	Jones	18.0	20.0	16.0	14.0	11.0	11.0	8.5	4.5	.....	.....	.....	....	12.87	8
4	Shortlegs	16.0	16.0	14.0	14.0	12.5	9.0	9.0	7.5	3.0	2.0	.....	....	10.3	10
5	Hereford	17.0	17.0	14.0	13.0	11.5	11.0	11.0	9.0	7.0	5.0	2.0	....	10.68	11
6	Red Cheeks	16.5	15.5	14.0	13.0	12.5	11.0	12.0	10.0	8.0	3.5	1.0	....	10.63	11
7	Paxon	16.5	14.5	12.5	12.0	10.0	9.0	7.0	6.0	6.0	.....	.....	...	10.38	9
8	Champion	19.0	15.5	14.5	12.0	11.0	10.0	11.5	10.5	8.0	8.0	7.5	6.0	9.0	16
9	Barry	14.5	16.5	12.5	13.0	12.5	12.0	12.0	9.5	8.5	8.0	7.5	7.0	9.0	17
10	Dasher	18.0	15.0	13.0	11.5	10.5	9.5	9.0	3.5	1.0	.....	.....	....	10.55	9
11	Cowslip	16.5	14 5	15.0	13.0	12.5	10.0	10.0	9.0	8.5	8.5	7.0	6.0	10.83	12
12	Charmer	21.0	16.5	16.0	15.0	15.0	11.0	10.5	9.0	7.5	7.0	7.5	6.0	10.06	16
13	Jones	18.5	16.5	15.0	13.5	12.0	11.0	10.5	9.0	7.0	6.5	6.0	5.5	8.64	17
14	Grenade, 5	17.0	14.0	12.0	10.0	9.5	9.5	8.0	6.0	2.0	.....	.....	....	9.77	9
15	Looseley	19.5	17.5	14.0	11.0	9.0	10.5	8.5	8.0	7.0	4.0	3.0	....	10.18	11
16	Cockhorn	17.0	19.0	17.0	14.5	13.0	13.0	12.0	11.5	8.0	10.0	9.0	7.0	12.15	13
17	Sandwich	18.0	18.0	14.0	12.0	10.5	10.5	9.0	9.5	7.5	6.5	6.5	5.0	10.15	13
18	Meadow Flower, 14 (first prize at Chippenham).	19.0	20.0	18.0	15.5	13.5	13.5	11.0	9.0	5.5	3.5	2.0	....	11.86	11
19	Hereford (Cox's)	20.0	17.5	17.5	14.5	14.0	12.5	9.5	8.0	3.0	.....	.....	....	12.94	9
20	Blossom	18.0	22.0	19.0	17.0	16.0	13.0	12.0	9.0	9.5	8.0	7.0	5.5	13.83	12
21	Widney	19.0	19.0	17.0	14.0	14.0	12.0	10.0	5.0	6.5	1.5	.....	....	11.8	10
22	Cherry	20.0	19.5	18.0	16.0	13.0	11.5	14.0	8.0	4.0	4.0	.....	....	12.8	10
23	Hereford (Cornish's)	20.5	19.0	18.0	18.0	15.5	13.0	11.5	10.0	6.0	.....	.....	....	14.61	9
24	Tiphorn	16.0	14.0	13.0	12.0	11.5	11.0	9.5	7.5	7.0	7.0	5.5	....	10.36	11
25	Hereford (old)	23.0	22.0	22.0	18.0	16.5	16.0	11.0	12.5	12.0	8.0	4.0	....	15.0	11
26	Noble	17.0	16.5	17.5	15.0	14.0	12.5	10.5	8.5	8.5	.....	.....	....	13.33	9
27	Fair Maid (second prize at Croydon, 1880).	17.0	16.0	13.0	11.0	9.5	10.0	7.5	8.5	7.5	6.5	4.0	....	10.04	11
28	Primrose	19.5	18.5	17.5	16.5	14.5	12.5	4.5	.....	.....	.....	.....	....	14.71	7
29	Darling	17.0	16.0	15.0	12.5	12.5	13.5	12.5	10.5	8.5	11.5	9.0	6.0	12.04	12
30	Lily	17.0	16.0	15.0	12.0	10.5	10.0	10.5	12.5	10.0	11.0	9.5	9.5	10.50	15
31	Champion	20.0	19.9	17.9	15.5	14.5	14.0	12.5	13.5	9.5	8.5	.....	....	14.4	10
32	Droophorn	17.5	16.5	15.0	15.0	13.5	13.5	10.0	.....	.....	.....	.....	....	13.0	7
33	Lady	17.0	15.5	13.0	10.5	10.5	10.5	8.5	7.0	.....	.....	.....	....	11.56	8
34	Bride	18.0	19.0	18.0	12.0	13.5	13.5	12.5	10.5	10.0	9.5	7.5	....	13.09	11
35	Peasant	18.0	16.0	16.5	15.5	15.0	14.5	12.5	14.5	11.5	10.5	9.0	5.0	13.20	12
36	Pearl, 10	16.5	13.5	12.5	12.0	11.5	8.5	7.5	7.5	6.5	6.5	.....	....	10.25	10
37	Henrietta, 17	16.0	13.0	12.0	12.0	10.0	8.5	8.5	5.5	4.5	.....	.....	....	10.0	9
38	Cornish	20.0	20.0	17.0	14.5	15.0	11.5	9.5	10.0	.....	.....	.....	....	14.68	8
39	Shortlegs	22.0	21.5	21.5	15.5	8.5	6.5	8.0	7.0	6.0	4.5	.....	....	12.1	10
40	Minnie	18.0	17.0	15.0	14.0	13.5	13.5	12.0	9.5	9.0	6.5	6.5	8.0	10.09	16
41	Infanta	20.0	21.0	18.0	14.0	13.0	8.5	7.5	7.0	6.0	5.0	.....	....	12.0	10
42	Bailey	19.0	16.0	19.5	18.0	17.0	15.0	11.0	10.5	8.0	2.5	.....	....	13.65	10
43	Ariel, 3	15.5	12.5	11.5	10.5	7.5	7.0	7.0	5.5	5.5	5.0	3.5	....	8.35	11
44	Venus, 3	17.5	16.0	14.0	11.5	10.5	10.5	9.5	9.5	8.5	6.5	4.5	....	11.04	11
45	Sandy	14.5	15.5	12.5	12.0	11.5	11.0	9.0	8.0	7.5	6.5	2.5	....	10.04	11
46	Brindle	16.0	13.5	10.5	9.5	9.0	7.5	5.5	4.5	4.0	.....	.....	....	8.88	9
47	Brownie	16.5	15.5	13.5	13.5	10.5	8.5	7.0	6.0	5.5	4.0	2.5	....	9.36	11
48	Moreton	17.5	16.0	14.0	11.5	11.0	9.0	7.0	5.0	.....	.....	.....	....	11.37	8
49	Cherrywhite	18.0	17.5	15.0	14.5	14.0	11.0	10.0	7.0	5.5	5.5	3.5	4.0	10.37	12
50	Ruby	15.5	15.5	13.5	11.0	10.5	9.5	5.5	.....	.....	.....	.....	....	11.57	7
51	Venus, 2	19.0	17.0	15.0	15.0	14.0	12.5	10.5	9.5	5.5	2.5	.....	....	10.0	10
52	Minikin	19.0	15.5	12.0	12.0	12.0	12.0	10.0	5.5	1.0	.....	.....	....	11.0	9
53	Betts	16.0	15.5	13.5	13.0	12.0	11.0	9.5	8.0	7.0	6.5	.....	....	11.2	10
54	Star	16.0	14.5	12.0	13.0	12.0	9.5	6.5	3.0	.....	.....	.....	....	10.81	8
55	Dumpling	19.0	18.0	15.0	14.0	14.5	13.0	10.0	7.5	6.5	3.0	.....	....	12.55	10
56	Infant	25.5	17.5	17.5	15.5	13.5	12.5	11.0	11.0	11.0	7.5	7.0	....	13.31	11
57	Charmer (first prize at Islington, 1879).	20.0	25.0	25.0	23.5	20.5	20.5	14.0	12.0	12.0	11.0	12.5	8.0	17.0	12
58	Stopps	17.0	16.5	14.0	12.0	10.5	9.5	5.5	3.5	.....	.....	.....	....	11.06	8
59	Stag	21.0	22.0	22.0	22.0	20.0	17.5	15.5	12.5	10.0	8.5	7.0	7.5	14.14	14
60	Fancy	19.0	18.5	15.0	15.0	15.5	12.0	11.0	9.0	8.0	6.5	8.5	5.5	10.92	14
	Average for sixty cows.	18.07	17.09	15.03	13.75	12.55	11.34	9.72	7.94	6.01	4.67	3.05	1.85	11.5	10.81

If the cow, at the time of calving, gives milk to be represented by 100, she will give—

In the second month	5.424 less.
In the third month	16.823 less.
In the fourth month	23.907 less.
In the fifth month	30.548 less.
In the sixth month	37.285 less.
In the seventh month	46.209 less.
In the eighth month	58.060 less

Example.—A cow gives an average of 20 quarts per day in the second month after calving. How much did she give at the time of calving?

Represent the amount or quantity she gave by 100, and we find by the table that she now gives an average of 5.424 per cent. *less.* 100—424 = 94.576 = the percentage she now gives, $\frac{100}{94576}$ = 1.0573.

In order to facilitate the work and to render it more accurate, giving the coefficients not only by months but by weeks, the following table was prepared by Monsieur Coilpo:

TABLE NO. 2.

Description.	First month.	Second month.	Third month.	Fourth month.	Fifth month.	Sixth month.	Seventh month.
One to seven days............	1. 0000	1. 0573	1. 2023	1. 3142	1. 4398	1. 5935	1. 8591
Seven to fifteen days..........	1. 0137	1. 0902	1. 2284	1. 3435	1. 4754	1. 6525	1. 9482
Fifteen to twenty-two days ..	1. 0270	1. 1251	1. 2558	1. 3741	1. 5128	1. 7160	2. 0465
Twenty-two to thirty days...	1. 0428	1. 1624	1. 2843	1. 4062	1. 5521	1. 7847	2. 1551

Example.—A cow having calved five months and twelve days ago, gives now 8.75 quarts per day. How much did she give at the time of calving?

She is in the sixth month of her lactation. Seek the intersection of the perpendicular column of that month, and the horizontal line of "seven to fifteen days," and we find the coefficient 1.6525; that is, she gave at the time of calving $1\frac{6525}{10000}$ more milk than she does at the end of five months and twelve days. Multiply the coefficient 1.6525 by the amount of milk she now gives, 8.75 quarts, another answer will be what she gave at the time of calving in 8.72 × 1.6525 = 14.46 quarts, the answer.

These tables do not pretend to mathematical correctness—that cannot be attained by any table or formula. They only pretend to give from the test of experience the probable rate of decrease or "taper" which may be expected in the milk-giving qualities of cows.

When the calculation is sought to cover a long period of milking, like ten or twelve months, it becomes uncertain. The jury did not apply it for a greater period than seven months.

I now give the result of the competitive examination, being the table presented by the jury.

I have continued the weight in kilograms and the measure in liters. The law of the United States has legalized the metric system and allows it to be used (Rev. Stat., sec. 3570). A kilogram is equivalent to 2.2046 pounds avoirdupois, and 1 liter is equivalent to 1.0567 quarts. Roughly stated, a kilogram is 2 pounds, and a quart and a liter may be taken as synonymous. Any one interested can easily make the calculation to his own satisfaction.

Twenty-two of these cows in the table gave over 20 liters, twelve gave over 24 liters, three gave over 28, two over 30, while one gave 34.3 liters, or over 8 gallons of milk, as her daily yield. Twenty gave over 2 liters of cream, five gave over 3, while one gave 4.7 liters.

Calculating by the table aforesaid, the jury decided the amount of cream given by the eight highest at the time of calving to be as follows, and awarded the prizes accordingly:

Number.	Liters of cream at calving.	No. of prize.	Description and amount of prize.
23	6,113	1	Gold medal and 250 francs.
62	5,554	2	Silver medal and 225 francs.
67	4,934	3	Bronze medal and 200 francs.
73	4,442	4	Bronze medal and 175 francs.
68	4,196	5	Bronze medal and 150 francs.
52	4,148	6	Bronze medal and 125 francs.
30	4,132	7	Bronze medal and 100 francs.
22	3,682	8	Bronze medal and 75 francs.

Some of these cows had calved more than seven months previous, and the rule was not applied to them, but special prizes were given. Six cows from eight to nine months previous; four cows from ten to eleven months previous; four cows from thirteen to fourteen months previous; three cows from seventeen to twenty-two months previous. One of them had calved more than twenty-two months previous, yet she gave as her daily yield 20.546 liters of milk, from which was taken 1.36 liters of cream. The jury awarded her a prize, as they say, "for her remarkable persistence."

It must not be supposed these were the only cows tested, or that these were the only prizes awarded. Subdivision or groups were made according to residence of owner, age of heifer, &c., and this of which I have been speaking is only the report of the jury on milk or cream. There were several others. The milk of some cows contained three times as much cream as others. One gave 15.80 per cent. of cream, while another gave but 4.74 per cent.

In the majority of cases the morning milk was superior to that of the midday or evening.

The specific gravity varied between 1,026.3 and 1,038. Of the one hundred and sixty-eight samples of milk tested for specific gravity, twenty-five fell below 1,029.

TABLE No. 3.—*Showing quantity and quality of milk of cows of the Dutch and Flemish breeds and their crosses.*

Number of cows.	Proprietors.	Time of calving to day of test, July 12, 1881.		Hour of milking.	Weight of milk (in kilos.).	Density of milk at 58⅛° F.	Product of each milking (in liters).	Volume of cream in product of each milking (in liters).	Amount per cent. of cream in the three milkings when taken together.	Volume of cream according to Table III at the time of calving (in liters).	Co-efficient from Table III with which to multiply totals in column 7.
	(1)	(2)		(8)	(4)	(5)	(6)	(7)	(8)	(9)	
		Mos.	*Dys.*								
1	J. Talboom, of Haesdonck	10	4	Morning ..	8.800	1030.0	8.544	0.709	9.68	......	......
				Noon	5.925	29.5	5.755	0.576			
				Night.....	5.100	28.9	4.957	0.580			
				Total ..	......	......	19.256	1.865			
4	L. Van Peteghem, of Saffelare.	5		Morning ..	5.545	28.4	5.392	0.609	8.85	2.161	1.5935
				Noon	3.630	28.3	3.530	0.399			
				Night.....	3.170	28.9	3.081	0.348			
				Total ..	......	......	12.003	1.356			
5	J. Piers de Raveschoot, of Olsene.	1	13	Morning ..	10.350	31.7	10.032	0.803	9.94	2.652	1.0902
				Noon	7.735	31.4	7.500	0.750			
				Night.....	7.130	29.5	6.926	0.880			
				Total ..	......	......	24.458	2.433			
7	J. Vercauteren, of Heusden.[1]	5	2	Morning ..	11.320	32.5	10.964	0.800	8.08	3.219	1.5935
				Noon	7.900	31.4	7.660	0.666			
				Night.....	6.560	30.6	6.365	0.554			
				Total ..	......	......	24.989	2.020			
8	J. F. Schollier, of Leerne St. Martin.	9	23	Morning ..	4.540	30.1	4.407	0.573	12.91	......	......
				Noon	3.375	30.3	3.276	0.436			
				Night.....	2.815	29.5	2.734	0.336			
				Total ..	......	......	10.417	1.345			
9	......do	9	2	Morning ..	5.760	27.7	5.605	0.729	11.43	......	......
				Noon	3.790	28.9	3.684	0.368			
				Night.....	3.165	28.3	3.078	0.317			
				Total ..	......	......	12.367	1.414			
10	A. Claus, of Meirelbeke...	1	26	Morning ..	6.620	31.9	6.415	0.513	7.95	1.418	1.1624
				Noon	5.095	31.1	4.941	0.361			
				Night.....	4.105	31.4	3.980	0.346			
				Total ..	......	......	15.336	1.220			
11	F. Tollens; of Lovendeghem.	4	29	Morning ..	6.832	31.6	6.623	0.510	9.77	2.837	1.5521
				Noon	7.100	30.0	6.893	0.710			
				Night.....	5.350	30.0	5.194	0.608			
				Total ..	......	......	18.710	1.828			
16	J. Van Haelst, of Watervliet.	3	1	Morning ..	12.020	33.0	11.636	0.892	8.73	3.179	1.2843
				Noon	9.640	30.3	9.356	0.873			
				Night.....	7.560	30.1	7.339	0.710			
				Total ..	......	......	28.331	2.475			
17	L. Van Ongeval, of Steenhuize-Winhuizen.	(?)		Morning ..	8.360	30.7	8.111	0.865	11.92	......	......
				Noon	5.820	30.0	5.650	0.716			
				Night.....	4.445	30.0	4.315	0.575			
				Total ..	......	......	18.076	2.156			
22	C. Bouckaert, of Lootenhulle.[2]	5		Morning ..	7.620	32.2	7.382	1.058	14.75	3.682	1.5521
				Noon	5.290	31.1	5.134	0.804			
				Night.....	3.670	31.4	3.558	0.510			
				Total ..	......	......	16.074	2.372			

[1] Honorable mention.

[2] Eighth prize.

TABLE No. 3.—*Showing quantity and quality of milk &c.*—Continued.

Number of cows.	Proprietors.	Time of calving to day of test, July 12, 1881.		Hour of milking.	Weight of milk (in kilos.).	Density of milk at 54° F.	Product of each milking (in liters).	Volume of cream in product of each milking (in liters).	Amount per cent. of cream in the three milkings when taken together.	Volume of cream according to table No. III at the time of calving (in liters).	Co-efficient from Table III with which to multiply totals in column 7.
	(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)	
		Mos.	*Dys.*								
23	F. Van Hecke, of Baeygem.[1]	6	17	Morning..	11.020	30.1	10.698	1.391	12.34	6.113	2.0465
				Noon	7.730	29.5	7.508	0.976			
				Night.....	6.175	29.2	6.000	0.620			
				Total ..	......	......	24.206	2.987			
24	Ch. De Mul, of Sinay	8	27	Morning..	10.490	29.3	10.191	0.815	10.64	......	......
				Noon	6.930	29.2	6.733	0.830			
				Night.....	6.805	28.9	6.613	0.860			
				Total ..	......	......	23.537	2.505			
25	R. Vanhoorzeele, of Saffelare.	4	27	Morning..	5.090	31.5	4.934	0.296	6.01	......	......
				Noon	3.570	30.3	3.465	0.219			
				Night.....	2.925	31.1	2.836	0.161			
				Total ..	......	......	11.235	0.676			
26	F. Martens, of La Pinte ..	8	30	Morning..	4.920	31.6	4.769	0.302	8.18	......	......
				Noon	4.385	30.0	4.257	0.411			
				Night.....	3.322	29.5	3.226	0.290			
				Total ..	......	......	12.252	1.003			
27	J. De Sloovere, of Seveneecken.[2]	3	21	Morning..	8.680	28.6	8.439	1.378	14.24	3.435	1.3741
				Noon	5.147	30.3	4.995	0.682			
				Night.....	4.237	29.5	4.115	0.439			
				Total ..	......	......	17.549	2.499			
29	Ch. Neyt, of Sleidinge.....	8	2	Morning..	5.150	26.6	5.016	0.702	13.77	......	......
				Noon	4.265	27.0	4.152	0.526			
				Night.....	3.880	27.3	3.777	0.555			
				Total ..	......	......	12.945	1.783			
30	......do[3]	4	27	Morning..	10.200	29.5	9.907	1.090	12.03	4.132	1.5521
				Noon	7.557	28.0	7.351	0.955			
				Night.....	5.000	27.3	4.867	0.617			
				Total ..	......	......	22.125	2.662			
31	B. Veyt, of Waerschoot...	2	4	Morning..	10.820	33.6	10.468	0.523	4.74	1.403	1.2023
				Noon	8.142	30.6	7.902	0.395			
				Night.....	6.402	30.6	6.211	0.248			
				Total ..	......	......	24.581	1.166			
33	C. Devos, of Zwynaorde ..	(?)		Morning..	9.287	31.5	9.008	0.720	9.92	......	......
				Noon	6.722	30.3	6.524	0.783			
				Night.....	5.285	30.6	5.128	0.547			
				Total ..	......	......	20.655	2.050			
34	Aug. Van Loo, of Destelbergen.	22		Morning..	9.610	29.7	9.331	0.559	6.62	......	......
				Noon	6.400	29.5	6.216	0.435			
				Night.....	5.140	28.3	4.999	0.366			
				Total ..	......	......	20.546	1.360			
36	J. Vergauwen, of Beveren-Waes.	4	15	Morning..	2.535	29.5	2.462	0.270	11.60	......	......
				Noon	1.700	28.3	1.653	0.198			
				Night.....	1.365	29.5	1.325	0.163			
				Total ..	......	......	5.440	0.631			

[1] First prize.

[2] Ninth prize.

[3] Seventh prize.

TABLE No. 3.—*Showing quantity and quality of milk, &c.*—Continued.

Number of cows.	Proprietors.	Time of calving to day of test, July 12, 1881.		Hour of milking.	Weight of milk (in kilos.).	Density of milk at 58½° F.	Product of each milking (in liters).	Volume of cream in product of each milking (in liters).	Amount per cent. of cream in the three milkings when taken together.	Volume of cream according to Table III at the time of calving (in liters).	Co-efficient from Table III with which to multiply totals in column 7.
	(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	9)	
		Mos.	*Dys.*								
37	M. Dobbelaere-Hulin	1	5	Morning..	3.120	31.7	3.024	0.171	5.79	......	......
				Noon	2.170	32.7	2.101	0.111			
				Night.....	1.730	31.6	1.677	0.112			
				Total..	......	......	6.802	0.394			
39	J. Van Damme, of Saffelare.	(?)		Morning..	3.865	32.1	3.745	0.273	7.30	......	......
				Noon	2.542	32.2	2.461	0.172			
				Night.....	1.410	32.5	1.365	0.118			
				Total..	......	......	7.571	0.563			
42	D. Vincent, of Leerne St. Martin.	3	14	Morning..	8.950	30.4	8.686	0.608	8.12	2.413	1.3435
				Noon	7.460	30.0	7.242	0.651			
				Night.....	6.350	29.5	6.168	0.536			
				Total..	......	......	22.096	1.795			
43	H. Haelterman, of Oultre..	6	27	Morning..	7.880	33.5	7.624	0.587	8.34	3.172	2.1551
				Noon	5.990	33.6	5.795	0.463			
				Night.....	4.350	32.8	4.211	0.421			
				Total..	......	......	17.630	1.471			
44	P. Vanlangenhaeke, of Appelterre.[1]	1	2	Morning..	11.550	32.2	11.189	1.342	12.86	3.333	1.0573
				Noon	8.650	29.7	8.401	1.318			
				Night.....	5.060	32.2	4.902	0.490			
				Total..	......	......	24.492	3.150			
45	F. Martens, of La Pinte ..	1	26	Morning..	3.560	34.4	3.441	0.344	10.60	......	......
				Noon	2.850	33.6	2.757	0.275			
				Night.....	2.360	33.4	2.283	0.280			
				Total..	......	......	8.481	0.899			
51	S. Dossche, of Melle	5	3	Morning..	9.380	31.5	9.093	0.700	9.53	3.170	1.5935
				Noon	6.800	31.4	6.593	0.705			
				Night.....	5.320	30.6	5.162	0.583			
				Total..	......	......	20.848	1.988			
52	L. DeWilde, of Moortzeele[2]	5	10	Morning..	11.140	32.4	10.790	0.863	10.20	4.148	1.6525
				Noon	7.970	29.2	7.743	0.875			
				Night.....	6.260	30.6	6.074	0.772			
				Total..	......	......	24.607	2.510			
53	J. Van Impe, of Semmerzake.		7	Morning..	5.960	33.8	5.765	0.768	13.72	2.050	1.0000
				Noon	4.853	33.3	4.696	0.564			
				Night.....	4.632	32.8	4.485	0.718			
				Total..	......	......	14.946	2.050			
57	J. Vandevoorde, of Ervelde.	11	9	Morning..	5.477	30.9	5.312	0.478	10.82	......	......
				Noon	5.280	31.1	5.127	0.547			
				Night.....	4.262	29.5	4.139	0.552			
				Total..	......	......	14.578	1.577			
58	MM. De Beer, frères, of Gand.	1	13	Morning..	7.620	34.1	7.369	0.639	9.30	......	......
				Noon	7.300	32.2	7.072	0.684			
				Night	5.859	31.7	5.679	0.549			
				Total..	......	......	20.120	1.872			

[1] Honorable mention.

[2] Sixth prize

TABLE No. 3.—*Showing quantity and quality of milk, &c.*—Continued.

Number of cows.	Proprietors.	Time of calving to day of test, July 12, 1881.		Hour of milking.	Weight of milk (in kilos.).	Density of milk at 58½° F.	Product of each milking (in liters).	Volume of cream in product of each milking (in liters).	Amount per cent. of cream in the three milkings when taken together.	Volume of cream according to Table III at the time of calving (in liters).	Co-efficient from Table III with which to multiply totals in column 7.
	(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)	
		Mos.	*Dys.*								
62	T. Van Wonterghem, of Meyghem.[1]		27	Morning..	13.990	34.4	13.525	1.713	13.93	5.554	1.1624
				Noon	12.560	33.6	12.152	1.944			
				Night......	8.907	32.8	8.624	1.121			
				Total..	......	......	34.301	4.778			
66	J. De Ruyte, of Belcele...		23	Morning..	10.295	34.1	9.955	1.195	12.25	......	......
				Noon	8.042	34.7	7.771	0.933			
				Night......	6.063	33.9	5.864	0.762			
				Total..	......	......	23.590	2.890			
67	B^{on} G. Della Faille, of Huysse.[2]	4	2	Morning..	11.319	32.5	10.962	1.461	12.94	4.934	1.4398
				Noon	8.852	31.7	8.580	1.087			
				Night......	7.155	31.7	6.935	0.879			
				Total..	......	......	26.477	3.427			
68	P. F. Bolangier, of Meirelbeke.[3]	3	3	Morning..	11.810	30.6	11.459	0.840	10.28	4.196	1.3142
				Noon	10.670	29.5	10.364	0.967			
				Night......	9.480	26.3	9.237	1.386			
				Total..	......	......	31.060	3.193			
69	E. Verdegen, of Bachte-Maria-Leerne.	10	4	Morning..	4.919	33.6	4 759	0.571	12.42	......	......
				Noon	3.907	32.5	3.784	0.504			
				Night. ...	3.137	32.8	3.037	0.364			
				Total..	......	......	11.580	1.439			
72	Veuve Hamerlinck, of Wynkel.	3	15	Morning..	8.825	31.5	8.555	0.456	7.20	2.023	1.3741
				Noon	6.600	29.5	6.411	0.534			
				Night......	5.410	30.0	5.252	0.482			
				Total..	......	......	20.218	1.472			
73	Hospices of Moerbeke[4]...	3	20	Morning..	11.930	30.4	11.578	0.964	11.72	4.442	1.3741
				Noon	8.640	30.6	8.383	0.922			
				Night......	7.835	27.8	7.624	1.347			
				Total..	......	......	27.585	3.233			
74	Veuve Dellaert, of Saffelare.[5]	6	27	Morning..	4.435	31.9	4.297	0.675	15.80	3.393	2.1551
				Noon	3.035	31.4	2.941	0.450			
				Night......	2.815	31.4	2.728	0.450			
				Total..	......	......	9.966	1.575			
80	Veuve et enfants Vandevoorde, of Ertvelde.	10	2	Morning..	9.790	35.5	9.454	0.866	10.60	......	......
				Noon	8.260	32.2	8.002	0.880			
				Night......	6.875	31.2	6.667	0.810			
				Total..	......	......	24.123	2.556			
82	G. Wolters, of Mont St. Amand.		10	Morning..	11.180	33.0	10.822	0.830	8.37	2.334	1.0137
				Noon	8.770	33.3	8.487	0.721			
				Night......	8.460	33.4	8.186	0.751			
				Total..	......	......	27.495	2.302			

[1] Second prize. [2] Fourth prize. [3] Fifth prize. [4] Third prize. [5] Honorable mention.

TRANSPORTATION OF BELGIAN CATTLE TO THE UNITED STATES.

The intent of this dispatch would fail if I said nothing about transportation.

The law and regulations in force in the United States concerning tariff, inspection, and entry can be better determined there.

Cattle cannot be carried across the Atlantic with either safety or profit in sailing vessels. Steamships do not always take them. They must be offered in lots large enough to pay the expense of fitting up stalls for their accommodation. It may be recognized as the rule that steamships which carry passengers, either saloon or emigrant, will not carry cattle. There, doubtless, are exceptions, but not many. The authorities at New York object.

The White Cross line of steamers, Steinmann & Ludwig, Antwerp, agents, carry all the cattle from Belgium (and I believe from Holland) to the United States. They run to New York and to Montreal.

These shipments have been (to New York) in summer of 1880, 169 cattle; in summer of 1881, 230 cattle.

Two shipments have been made this present season to Montreal.

The prices are as follows:

	Per head.
Bulls and cows on deck	£5
Yearlings	4
Calves	3
Under deck, additional	1

The ship puts up the stalls and supplies the water; feed and men to care for the cattle are for shipper's account. French, Edge & Co., of New York, are agents for this line.

Canada has been interesting herself in the manner suggested to Americans in this dispatch. She has imported, for breeding purposes alone, from Belgium during the past year 62 head of cattle, and from England 32 bulls, 336 cows, and 21 calves, while her exports for beef have been, during the year 1880, to England alone, 50,905 head.

As to transportation: Mr. John C. Moosily, agent Red Star steamers, Antwerp; Steinmann & Ludwig, agents White Cross steamers, Antwerp; Wambersie & Son, ship-brokers, Rotterdam.

EXPORTATION OF AMERICAN HORSES TO BELGIUM.

Of course no recommendation of mine or indeed of any consul could be accepted upon our judgment solely or without examination and trial, but I venture to express my belief that a good business man—a judge of horses and cattle—could make a profitable business by the importation of cattle to the United States, as I have suggested, and, for a return cargo, exporting horses for use in Belgium, Holland, and France. The prices are high here, and for light driving and riding horses I think remunerative prices could be obtained.

This trade is already commenced, but is in its infancy. I hope my notice of it will attract the attention of those concerned.

A cargo of 60 American horses (mares) were landed within the past month at Bruges, in this consular district, and sold there at auction, bringing fair and satisfactory prices.

AUTHORITIES AND SOURCES OF INFORMATION.

I have been a personal witness to many of the things I have described; but I have received material aid in my examinations from the following gentlemen, to whom I tender my acknowledgments: Professor Leyder, of the Royal Agricultural Institute at Gaubloux, Belgium; Louis Tydgadt, esq., secretary of the Agricultural Society of Flandre Orientale, Ghent; Mr. P. F. L. Waldeck, secretary Holland Society, Loosdianen, near The Hague; Professor Bonar, agricultural engineer; Selzaete, director of abattoir, Brussels; Mr. Edward Minne, inspector of abattoir, Ghent; report of jury on quantity and quality of milk, prepared by Professor Chevron, of the Royal Agricultural Institute at Gaubloux.

THOMAS WILSON,
Consul.

UNITED STATES CONSULATE,
Ghent, October 27, 1881.

SPAIN.

CATTLE IN ANDALUSIA

REPORT BY CONSUL OPPENHEIM, OF CADIZ.

In pursuance of instructions given in Department circular of July 18, 1883, I transmit herewith certain tables bearing upon the grazing interest in this district. Stock-breeding, properly so-called, meaning thereby the improvement of cattle on a large scale by selection and crossing, may be said not to exist here. Individual experiments of crossing foreign cattle with the native breed have occasionally been made, but the results are said not to have been encouraging. Some years ago English Shorthorn cows were imported into the district of Jerez and crossed with the native bulls, but the experiment was unsuccessful, the breed deteriorating rapidly and tending to revert to the original native type. In the district of Puerto de Sta. Maria, there are now some cross-breeds, produced by crossing Swiss and native cattle (native bull and Swiss cows); the milk product of the cross-breed cow is much superior to that of the native, both in richness and in quantity, but the animals lose their hardiness, do not stand the heat well, and require shelter and artificial feeding almost the whole year round. These experiments, and probably many other similar ones unknown to me, have created an impression that the native stock of this district does not lend itself readily to improvement by crossing. The interest of this inquiry to our dairymen and cattle-breeders must further be lessened by the patent fact that the Andalusian cattle, outside of a good appearance and endurance of heat, do not seem to have any prominent points of excellence. They are not good milkers, and produce beef which, at its best, is only mediocre. On the other hand they are very cheaply kept, requiring hardly any shelter or care of any kind. That American breeders should import Andalusian stock is only conceivable in the somewhat remote contingency of our people developing a taste for bull-fighting. The fierceness and the mettle of the Andalusian bull are indisputable, and these traits are sufficiently developed even in some of the cows to make them somewhat undesirable as inmates of a dairy. Whilst the above considerations undoubtedly detract from the practical value of this inquiry to our stock-breeders, yet many interesting facts and data bearing upon the meteorology, the topography, the flora, as well as on the economical situation of this district may be included within its frame-work. Such of these data as are contained in the accompanying tables have been gathered in every case from the best available sources, and as far as they go are undoubtedly trustworthy.

ERNEST L. OPPENHEIM,
Consul.

UNITED STATES CONSULATE,
Cadiz, October 25, 1884.

Topography of the province of Cadiz.

Locality.	Altitude of highest point in meters above sea level.	Locality.	Altitude of highest point in meters above sea level.
San Fernando, (Bay of Cadiz)	29. 5	Sierra de Gibraltar	410—
Puerto Real (Bay of Cadiz)	9. 5	Medina	250—
Puerto de Sta. Maria (Bay of Cadiz)	8. 5	Chiclana	360—
Arcos	141—	Olvera	1,124—
Jerez	50—	Grazalema	1,750—
Utrera	43—		

NOTE.—The annual rainfall at the observatory of San Fernando is given at 656.03^{mm} (about 26 inches) this being the mean of ten years' observations. During the last two years the temperature of the soil has been taken daily, giving mean of temperature: At a depth of 0.63^{m}—17.6° centigrade; at a depth of 1.30^{m}—18.8° centigrade.

Mean temperature, 17.2° C. Summer, 23.1° C. Winter, 12.0° C., being results of ten years' observations at the San Fernando Observatory, and believed to be approximately correct for the coast districts and the lands where altitude does not exceed 50 meters above sea-level. In the central districts, and up to an altitude of about 250 meters above sea-level, the mean annual temperature is 15° centigrade; on the higher uplands, from 250 to 1,000 meters above sea-level, it is 12° centigrade.

SOIL.—*Alluvial:* There is some alluvial pasture on the Guadalete, the Guadalquivir, and other minor streams; this represents, however, but a very small percentage of the total pasturage. *Loam:* There is but little of this kind of soil in the province; the district of Olvera includes some largish tracts of "clayey loam" devoted to pasturage. *Clay and chalk:* These soils are frequently met with in natural meadows, especially in the higher pastures, probably representing from 35 to 40 per cent. of total grazing area in this province. *Sandy, &c.:* A large portion of the natural pastures of this province has sandy or gravelly soil; 40 to 45 per cent. is a fair estimate of the percentage having such soil.

Pasturage of Western Andalusia—species most abundant in natural pasture.

ORDER LEGUMINÆ.

Trifolium pratensis: wild clover, red and white.
Lotus corniculatus.
Hedysarium coronarium: French honey-suckle.
Hedysarium honobrichus.
Lathyrus silvestris: wild vetch.
Medicago sativa: lucerne.
Medicago lupulina.

ORDER GRAMINEÆ.

Avena fatua: wild oats.
Poa trivialis: meadow grass, chiefly the rough-stalked variety.
Lolium multiflorum: Italian rye-grass.
Festucas: fescue grasses, many varieties.
Bromus: brome-grass.
Triticum repens: couch-grass.
Phalaris canariensis: canary-grass.
Carlina acaulis: carline thistle.

CULTIVATED GRASSES.

Artificial pasture is very uncommon in this district, though here and there experiments have been made in that line; such pasture here seems to require very damp situations. In such spots clover (from American seed), with giant Italian rye-grass (from English seed), have given very good results.

A natural meadow, situate on undulating ground, near the river Guadalete, is estimated by its owner (a life-long agronomist) to have the following composition: Wild clover, (*Trifolium pratensis*) about 10 per cent.; couch-grass (*Triticum repens*) about 60 per cent.; wild canary-grass (*Phalaris canariensis*) about 5 per cent.; Italian rye-grass (*Lolium temulentum*) about 10 per cent; leaving about 15 per cent. for miscellaneous grasses and weeds, and this is believed to be a fair type of the natural pasture of the coast districts and less elevated lands. The upper pastures (from 250 meters above sea-level upwards) covering, probably, 60 per cent. of the total in the province, have a smaller proportion of Leguminæ than the low-lying tracts; wild clover is absent, and lucerne (*Medicago sativa*) takes its place; the French honeysuckle is very abundant, especially on chalky hill-sides and table-lands. Amongst the Gramineæ, the fescue grasses, wild oats, brome and the meadow grasses (*Poa*) thrive most luxuriantly in the higher pastures, and those species undoubtedly furnish a large proportion of the upland herbage.

Statement showing the area of pasture lands in the province of Cadiz.

[Total area of province 7.275 kilometers.]

Locality (judicial districts).	Natural pasture, treeless.	Natural pasture, timbered.	Totals.	Altitude of highest point in each district above sea-level.
	Hectares.	*Hectares.*	*Hectares.*	*Meters.*
Algeciras	30,174	11,405	41,579	*410
Arcos	8,947	6,862	15,809	141
Cadiz	62	....	62	†6
Grazalema	9,139	9,058	18,197	‡1,750
Chiclana	24,245	5,982	30,227	360
Jerez	13,419	40,990	54,409	50
Medina	21,447	35,359	56,806	250
Olvera	3,334	10,525	13,859	§1,124
Puerto Sta. Maria	7,758	1,919	9,677	8.5
San Fernando	257	....	257	29.5
Sanlucar	6,315	558	6,873	†10
San Roque	13,818	34,927	48,745	†400
	138,915	157,585	296,500	....

* Sierra de Gibraltar. † Altitude estimated, not measured. ‡ Cerro del Pinar. § Pico del Algibe.

NOTE.—The hectare = 2.47114 acres.

Statistics of cattle of Western Andalusia.

Measurements taken.	Size at maturity.		
	Cow.	Bull.	Ox.
	Ft. In.	*Ft. In.*	*Ft. In.*
Height	4 4	4 10	4 7½
Girth	6 7	7 4	6 10
Length of head	1 8	2 3	2 2
Breadth of head	10	1 4	1 2½
Length of horns	1 6½	2 6	2 3

Name of breed: Andalusian.

Yield of milk: Milk is rarely collected; quantity of dairy yield of a fair cow is estimated at 7 kilograms per day.

Milk to pounds of butter: Unknown; butter-making as a regular industry does not exist.

Milk to pounds of cheese: Unknown; very little cheese is made.

LIVE WEIGHT.—*Cow:* 255 kilograms; *bull:* 380 kilograms; *ox:* 335 kilograms.

Age at maturity: Four and a half to five years.

WEIGHT OF MEAT AT MATURITY.—*Ox:* 225 kilograms; *bull:* 260 kilograms; *cow:* 170 kilograms.

Color: Pure black and pure red cattle are the most abundant; next common are spotted black and white, then spotted red and white.

Description: The Andalusian cattle are fairly proportioned animals, neither high nor low on the leg; rather deep-chested and clear-limbed. The contour of the back is level, what is called in English grazier parliance "square-cut." The horns as a rule spread at right angles from the head, ends being curved slightly upwards. The head is of normal shape, tapering, however, a good deal towards the muzzle.

How long bred pure: From time immemorial very few foreign animals have ever been imported for cross-breeding purposes, and those few only very recently, so that the practical results of cross-breeding are not definitely established.

Labor: Oxen work up to about nine years of age, thus giving about four years' plowing or hauling; the usefulness of a good steer at either work is considered equal to that of a mule, whilst cost of feeding the steer is only estimated at about half.

Milk: But rarely collected.

Cheese: Hardly any made.

Methods of housing: Are of the most primitive character; as dairying is not practiced, there are but very few cow stables. On most farms rough, open sheds are provided, under which animals seek shelter during inclement weather.

Feeding: It is the general custom to turn all animals but working oxen loose on the natural pasture; working oxen are fed during the three or four winter months on lleros (tares) and chopped straw, the rest of the year on grass only.

Breeding: Very little attention is paid to breeding, unless in the case of breeding bulls for the "Plaza." The desirable points in these animals being fierceness and mettle, only cows exhibiting these traits are used as dams; the process of selection is by having the animals lightly goaded by a man on horseback (el tentador) and those that turn upon the horse and exhibit most bravery are reserved for breeding.

Handling products: The production of cow's milk, butter, and cheese is very small; the local consumption of the two latter articles is supplied by other districts, and goat's milk is in general use. Hence it may be said that the products of the grazing industry in this province are beef and labor.

Statement showing the number of domestic animals in the province of Cadiz (*year* 1880).

Locality. (Judicial districts.)	Horses.	Mules.	Asses.	Neat cattle.	Sheep.	Goats.	Hogs.
Algeciras	1,379	85	505	8,033	6,953	8,677	5,397
Arcos	3,658	867	1,679	6,557	29,404	6,280	2,625
Cadiz	526	110	304	20	....	....	....
Grazalema	290	153	251	2,068	4,817	11,704	1,369
Chiclana	1,085	366	646	7,017	6,529	4,719	3,074
Jerez	5,552	307	1,205	17,079	11,876	4,881	*741
Medina	1,753	442	1,133	9,227	14,534	14,071	3,061
Olvera	912	654	1,265	3,210	5,527	7,716	3,909
Puerto Sta. Maria	496	144	1,146	1,815	768	2,018	400
San Fernando	58	45	50	100	....	....	58
Sanlucar	420	78	207	785	1,695	298	150
San Roque	1,021	118	387	4,182	5,391	9,184	1,340
Total	17,150	3,369	8,778	60,053	87,494	69,553	22,124

*The number of hogs in the district of Jerez is known to exceed considerably the figure given here

CATTLE IN CATALONIA.

Catalonia is not a stock-raising province, with the exception of mules in the northwestern portion, near the Pyrenees. The province of Catalonia is almost entirely an agricultural and not a stock-raising one. Only one-fourth of all cattle for the market is raised in the province, while three-fourths are imported as follows:

Beef.—During the winter from the Basque provinces and Galicia; during the summer from Argelia, Africa.

Milch cows.—Entirely from Switzerland at high prices.

Sheep.—From the De la Mancha, Spain, and Murcia.

Pork.—(The sale of which is prohibited during the six months of summer) from Estremadura and France.

All live stock for consumption is of very inferior class, as Catalonians feel no interest in stock breeding, but are entirely absorbed in the cultivation of the grape, almonds, nuts, and vegetables, besides general manufacturing, especially of cotton and woolen fabrics.

Respectfully,

FRED'K H. SCHEUCH,
Consul.

UNITED STATES CONSULATE,
Barcelona, December 12, 1883.

CATTLE IN GALICIA.

REPORT BY CONSUL CARRICARTE, OF CORUNNA.

I have the honor to forward the following statement respecting the cattle of this province:

The name of the cattle bred is Galician; annual average pounds of milk per head, 2,555; live weight per cow, 8 hundred-weight; live weight per ox, 14 hundred-weight; age at maturity, eight years; weight of meat at maturity, 7 hundred-weight; color, yellow; origin of breed, Spain.

Topography.—The altitude of the grazing country vary between 10 feet and 260 feet. The mean temperature as recorded at the capital, Corunna, is 56° Fahrenheit. The soil is of the most varied description and embraces every quality.

The substratum is most generally porous; limestone found in the east and centre of the province, and granite around the western coasts.

Cultivation by rotation of crops is not practiced. Clover and rye-grass are but little sown. On the wheat stubble (in July) oats or barley and turnips are sown to serve as green crops for winter.

Methods of housing.—Common dark stables; manure usually cleared out twice or thrice a year.

Feeding.—Almost all manger feeding as respects oxen, and pasture for cows; much wet meadow land.

Breeding.—Selections of sires little attended to and consequent degeneration as shown in lightness of hind quarters of the beasts.

Handling products.—Hand labor being cheap but little machinery is used, and the methods are primitive in the extreme.

Stock.—The stock of cattle is in excess of home demands. The surplus is exported to England and may be calculated to reach 40,000 oxen annually; the medium price per head being $75.

HOW TO EXPORT GALICIAN CATTLE TO THE UNITED STATES.

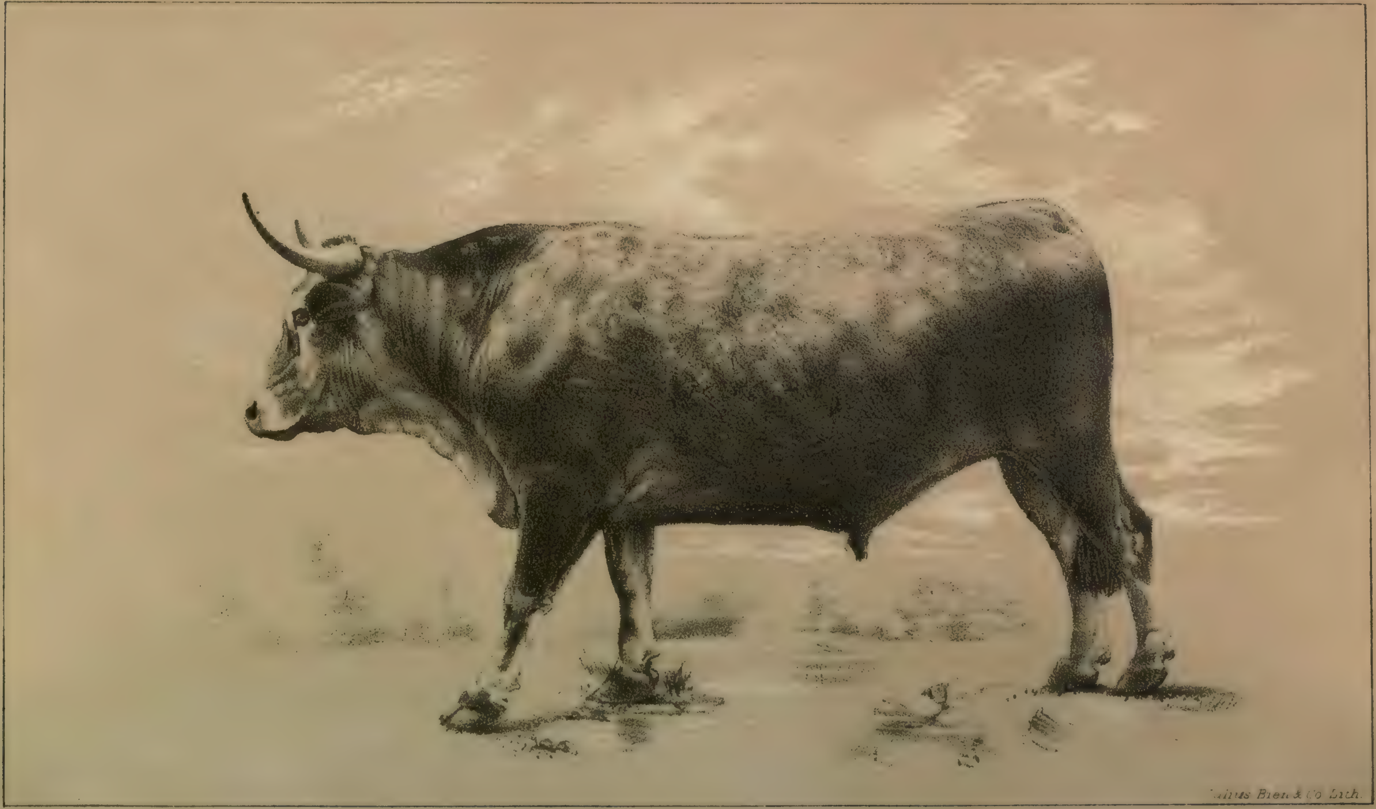
The best method for transporting cattle to the United States is via Liverpool or Plymouth, England; and the freight paid to either of these ports is $8 or $10 per head. The class of beasts for exportation to the United States should be young oxen from sixteen to eighteen months old, the price of which varies from $30 to $50 per beast.

The inclosed photographs are taken from animals belonging to a cargo for England, the price and age of each being noted.

J. DE CARRICARTE,
Consul.

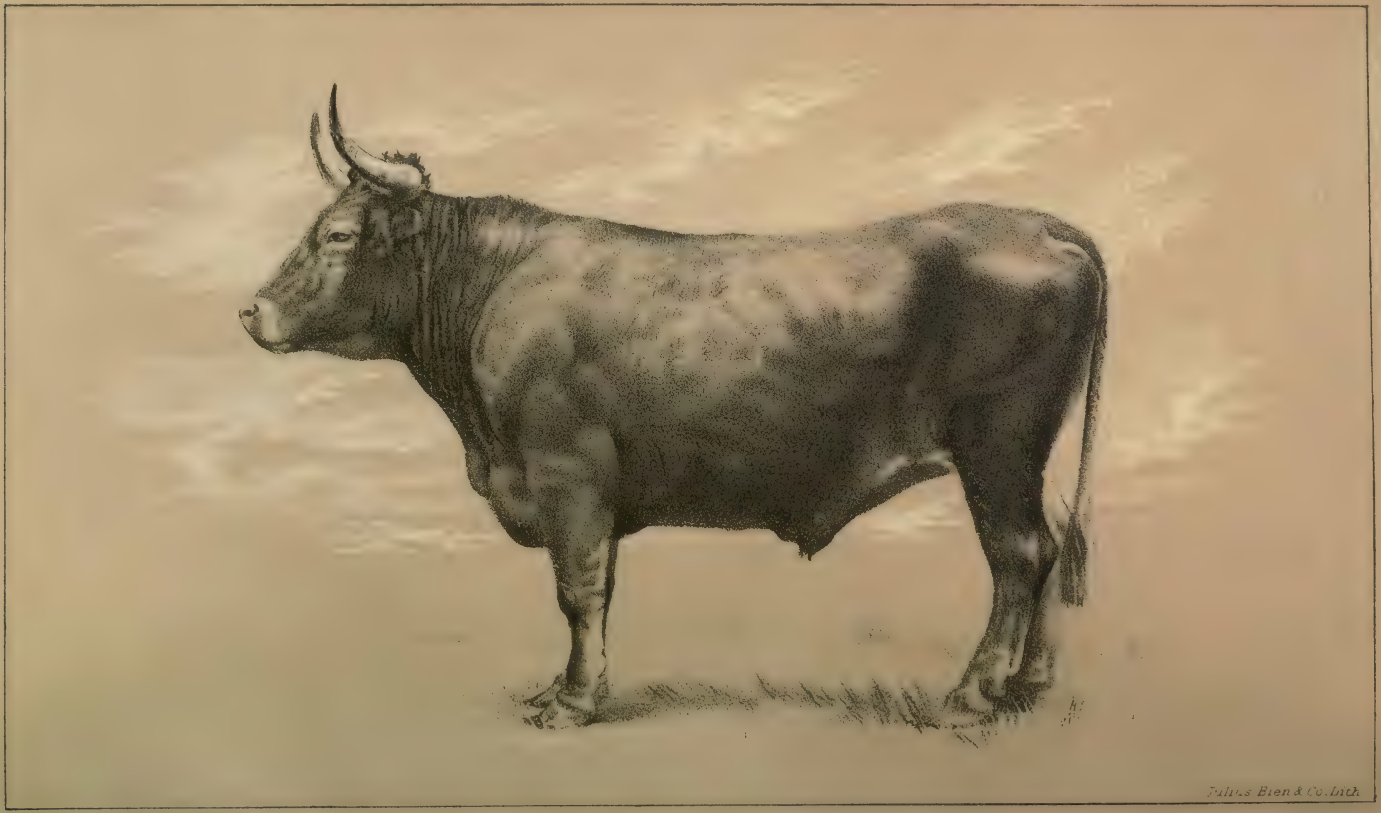
UNITED STATES CONSULATE,
Corunna, March 31, 1884.

PLATE 168


ulius Bien & Co Lith.

GALICIAN OX

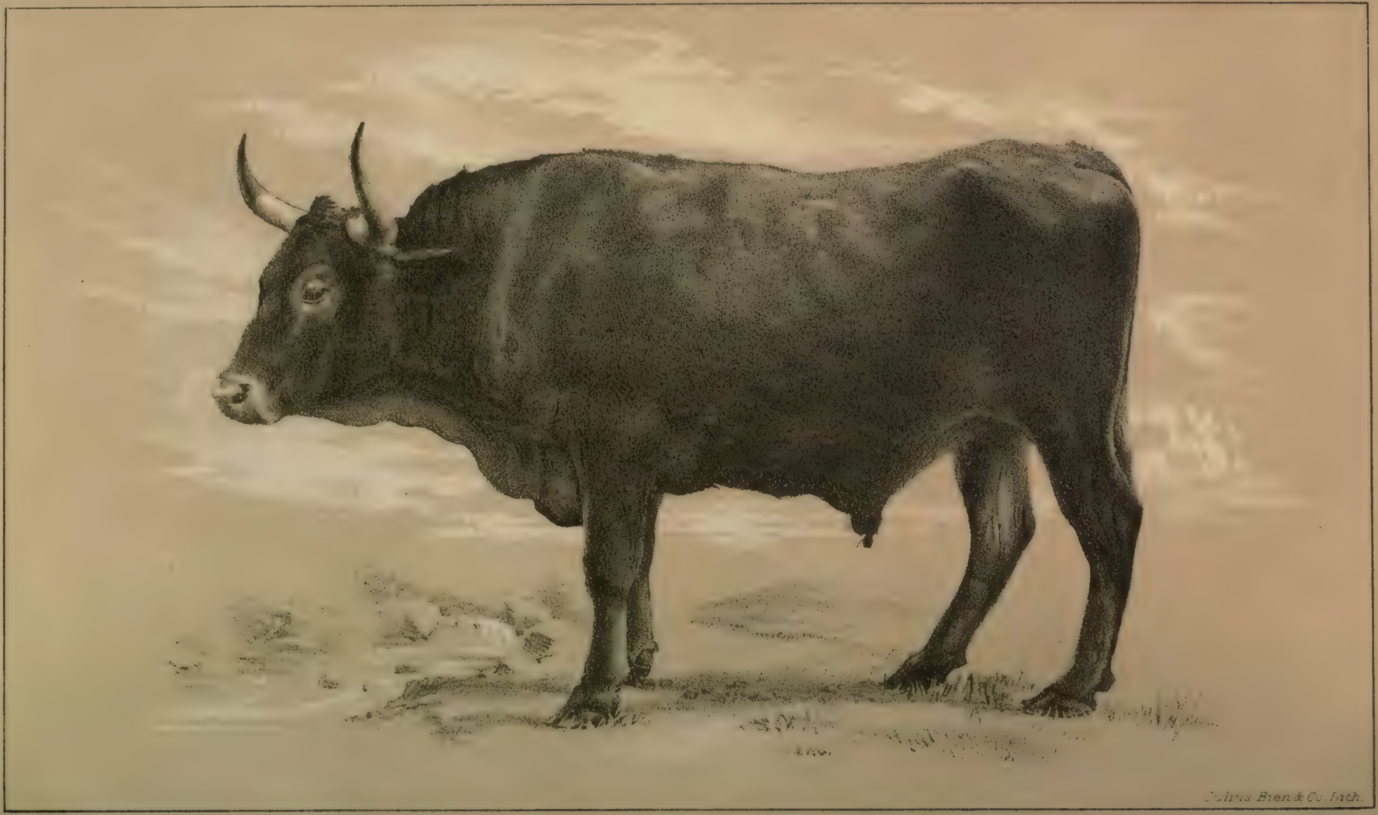
PLATE 169



Julius Bien & Co. Lith

GALICIAN OX

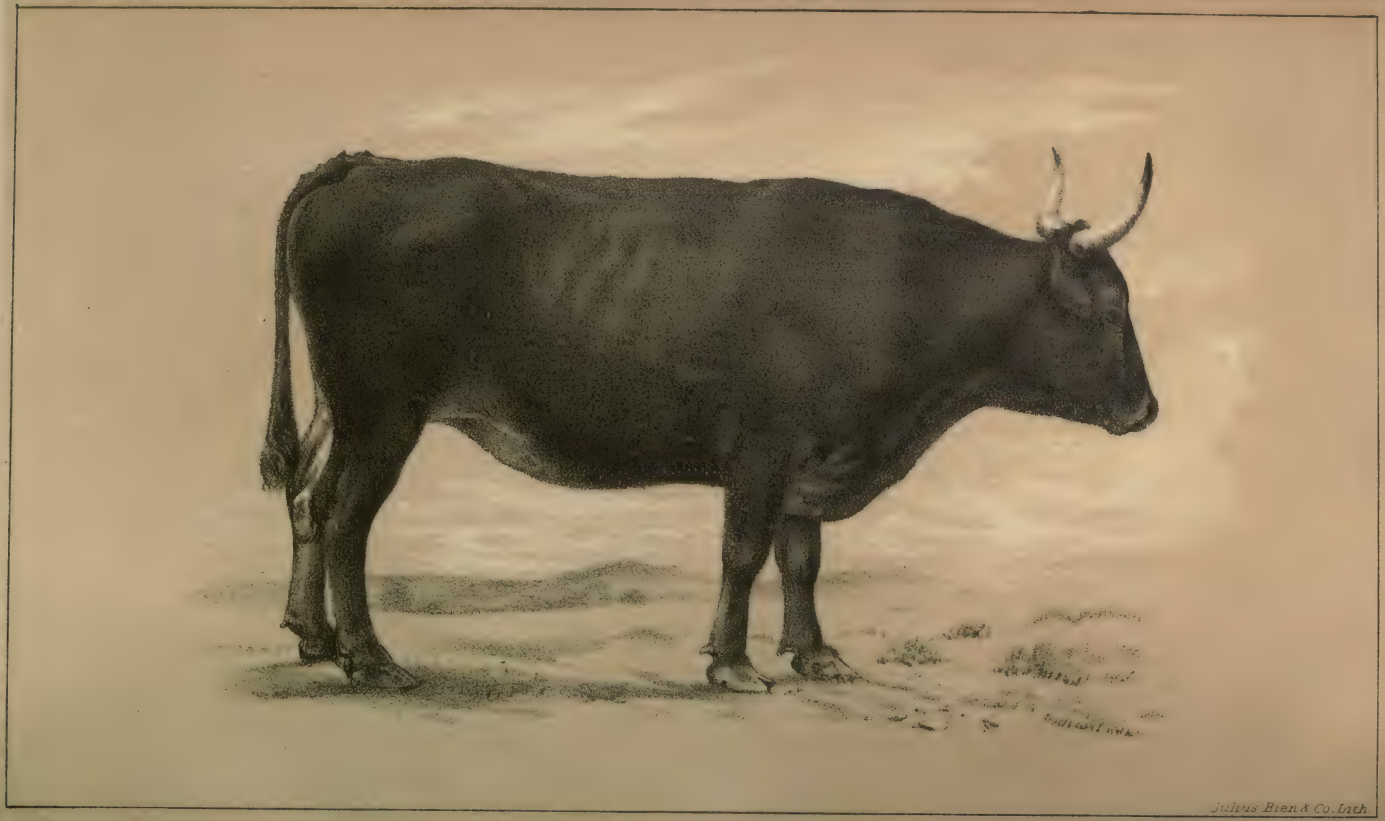
PLATE 170



Julius Bien & Co. Lith.

GALICIAN OX

PLATE 171



Julius Bien & Co. Lith.

GALICIAN OX

LIBRARY
OF THE
UNIVERSITY
OF
CALIFORNIA.

TURN CIRCULATION DEPARTMENT
D ➡ 202 Main Library

AN PERIOD 1 **HOME USE**	2	3
	5	6

ALL BOOKS MAY BE RECALLED AFTER 7 D
1-month loans may be renewed by calling 642
nonth loans may be recharged by bringing books to C
Renewals and recharges may be made 4 days prior

DUE AS STAMPED BELOW

JAN 9 1977		
REC. CIR. JUL 20 '78		

RM NO. DD 6, 40m, 6'76 UNIVERSITY OF CALIFOR
BERKELEY, CA

C 45426

39424
SF197
U6
V.1
UNIVERSITY OF CALIFORNIA LIBRARY